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For Members of the Naval Services and Subscribers (for the opinions expressed in this Journal)

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Notice to Authors

Contributions should be submitted to the Editor, Journal of the Royal Naval Medical Service, Royal Naval Hospital Haslar, Gosport, Hants PO12 2AA, who will arrange for any necessary security clearance. The attention of Medical Branch personnel is drawn to the provisions of QRRN Appendix 35.2.

Manuscripts should be prepared in the Vancouver style.[1] They should be typed with wide double spacing and wide margins and should include: title page, abstract (of not more than 150 words), introduction, method, results, discussion and references, each section commencing on a separate page. Written entry length is between 2000 and 3500 words, plus essential Tables or illustrations.

Tables and illustrations should be referred to in the text. Tables should be typed in double spacing on separate sheets. Line rosh should be pur fessionally drawn, making due allowance for the appropriate reduction. Glossy black and white photographs should be submitted unmounted whenever possible. Titles and detailed explanations should be given in the legends which should be typed on a separate sheet.

References should be numbered consecutively in the order in which they are first mentioned in the text. At the end of the article the full list of references should give the names and initials of all authors (unless more than six, when only the first three should be given followed by *et al*.). The author's names are followed by the title of the article, the title of the journal abbreviated according to the style of *Index Medicus*,[2] year of publication, volume number and first and last page numbers. Titles of books should be followed by the place of publication, the publisher and the year, e.g.

> Smith NA, Wasserman SI, Austen KF. Cold urticaria: release of the neutrophil chemotactic factor of anaphylaxis during cold challenge. *N Engl J Med* 1976; **294**: 687–90.
> Osler AG. *Complement: mechanism and function*. Englewood Cliffs: Prentice-Hall, 1976.

1 The Vancouver style. *J Am Med Assoc* 1979; **65**: 179.
2 International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. *Br Med J* 1982; **284**: 1766–70.

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SICK BERTH PETTY OFFICERS EFFICIENCY MEDAL

In April 1913 a retired Royal Navy Surgeon expressed his desire to donate anonymously £100 for the purpose of striking a medal. This was to be awarded to the members of the Sick Berth Staff who had shown the greatest zeal and efficiency during the previous year. Although outwardly a simple request, Their Lordships at the Admiralty, the Master of the Royal Mint, the British Museum and the Victoria and Albert Museum were all consulted. By August 1913 the announcement of the Sick Berth Stewards Efficiency Medal has been published in Admiralty Monthly Orders and all aspects of the award resolved with the exception of the design. A further cheque for £100 was received later that year and, because of the loss of the original cheque, a third was forwarded in January 1920. In July of that year working models of the medal were forwarded to the Mint. In August however the title Sick Berth Steward was changed to Sick Berth Petty Officer and new models took a further six months to obtain. Delays in production ensued and the first medal was eventually awarded more than two years after the benefactor first wrote to the Admiralty. Problems concerning the cost of the medal and investment of the balance of funds to provide an annual income dogged the Admiralty throughout and it was not until August 1922 that a solution was found.

The medal shown above was the third struck, awarded to Sick Berth Petty Officer A. H. Megayer 351606 in 1923, and is now on display in the museum at the Royal Naval Hospital, Haslar.

Editorial

In response to my editorial in the Winter edition of the *Journal* the Editorial Committee is delighted to inform you that it has received a number of very good and interesting articles for publication This is most encouraging and I am hopeful that the trend will continue. To encourage the view that the *Journal* belongs to the Royal Naval Medical Service as a whole the Editorial Committee has been expanded to include the Head of Medical Services Branch and a representative of the Queen Alexandra s Royal Naval Nursing Service Subscribers are asked to relate this change to those in the RNMS who do not currently receive the *Journal* in order that we may increase our circulation and also the range of contributions for publication

1984 is a memorable year as it sees the centenaries of both the Medical Assistant Branch and the Queen Alexandra s Royal Naval Nursing Service The two leading articles are most interesting and give an excellent insight into the history and training of the Medical Assistant over the years culminating in the training package which he receives today Many of us had the honour of serving with Sick Berth Attendants and would wish to support the centenary celebrations An outline of the arrangements is contained in a letter to the Editor published in this edition

Farewell to the SBA is a precis of a section in a book entitled *Dot or A 100 years history of the Medical Assistant Branch* which has been compiled by Commander S G Clark This is to be published by HMSO at £7 00 a copy and will be available in April May The book comprises five sections the first two being historical primarily up to 1884 and 1884 to 1984 followed by a section on training The last two sections are devoted to honours and awards and reminiscences This should make fascinating reading and will be complementary to a similar volume about the QARNNS which will be published later in the year

The Sick Berth Petty Officers Efficiency Medal which is the subject of the frontispiece has an interesting history I was intrigued to read Admiralty Fleet Order No 2227/8 dated 16 July 1919 a copy of which is reproduced below This was found under News of the Service in Vol V of the JRNMS

2455—Annual Medal for Sick Berth Staff

1 A retired Naval Officer who desires to remain anonymous has generously offered the sum of one hundred pounds (£100) to provide for the annual award of a medal (one of the sick berth staff in the RN for zeal and efficiency shown in the discharge of his duties during the preceding year

2 It has been decided to accept this offer and to employ the proceeds of the above sum in providing a Medal to be called the Sick Berth Stewards Efficiency Medal which will be awarded to man holding the rating of Sick Berth Steward in Portsmouth Devonport and Chatham Port Divisions in successive years.

3 Selection for the award of the Medal will be made as follows —

(a) Senior Medical Officers of HM Ships and Depots and of RN Hospitals and Hospital Ships will be entitled to forward (through the Captains and Flag Officers under whom they are serving) to the Surgeon Rear Admiral of the RN Hospital Haslar Plymouth or Chatham (according to which Port Division is entitled to the Medal for the year) the names of Sick Berth Stewards whom they recommend for the medal Each recommendation is to be accompanied by a copy of certificate mod S 457 together with a statement of any special services rendered during the year

(b) The Surgeon Rear Admiral will select and place in order of merit the three candidates whom he considers most worthy of the medal and will forward all recommendations received, with his selection to the MDG on January 1

(c) The MDG will report to the Admiralty the name rating and official number of the Sick Berth Steward to whom he recommends the medal shall be awarded

4 The first selection for the medal will be made by the Surgeon Rear Admiral at Haslar on January 1 1920 to a Sick Berth Steward of Portsmouth Port Division The award on January 1 1921 will be to Devonport Port Division and on January 1 1922 to Chatham Port Division and thereafter in rotation

5 The medal is *not* to be worn

Finances to support the medal have fluctuated over the years and to a large extent have been dependent on contributions from members of the Branch. Thanks to a generous donation by Surgeon Commander R T Jolly OBE from the royalties of his book *The Red and Green Life Machine* the finances are currently healthy. Further contributions would be most welcome and should be made payable to the Sick Berth Petty Officers Efficiency Medal Fund and forwarded to the Head of Medical Services Branch, Medical Directorate General (Naval).

There is no doubt that the corporate spirit in the Royal Naval Medical Service is very high. Nevertheless I am sure that there are many of us who rue the day we said Farewell to the SBA.

ROYAL NAVY MEDICAL CLUB

The next Royal Navy Medical Club Dinner will be held at the Royal Naval College, Greenwich on 14 September 1984. The College have decided that regular users will only be able to dine in the Painted Hall in alternate years and the Club Committee is looking for a suitable venue for the 1985 dinner.

The Annual Reception will once again be held in HMS *President* on 23 May 1984 at 1930. Keen gardeners will notice that this falls during the Chelsea Flower Show.

At present only 83 of the 314 serving medical officers are Club members. All past and present medical, dental, nursing and MS officers of the Royal Navy or the Reserve are entitled and encouraged to join the Club and all members are invited to the Dinner and the Reception.

Anyone wishing to join should complete the application form enclosed with this Journal and forward it to the **Honorary Secretary, Royal Navy Medical Club, Medical Directorate General (Naval), First Avenue House, High Holborn, London WC1V 6HE.**

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Farewell to the SBA

S G Clark

On 17 October 1884 official sanction was given to the establishment in the Royal Navy of a trained Sick Berth ratings branch which today is known as the Medical Services Branch. Before that date there were separate arrangements for the nursing of naval personnel both ashore and afloat.

The first mention of obligatory care for sick and wounded seamen appeared in the Laws of Oléron upon which the present Naval Discipline Act is based. Sometimes known as the Judgements of Oleron and dating from *circa* 1194 they are themselves based on a code of conduct founded in the Republic of Rhodes and adopted by the Romans and other Mediterranean maritime powers. They took their name from a small island off the French coast which in early times was a rendezvous for shipping.

The judgements gave instructions on the conduct of ships and the relationship between masters and crews. One pronouncement stated that in the event of a mariner's sickness it was the master's responsibility to put him ashore and seek a lodging for him and to provide him with a candle of tallow and one of the ship's boys to tend him or, failing that, a hired woman.

King Richard Coeur de Lion introduced these laws in England having first met them during the Crusades where the forces included a strong contingent from Oleron. Thus from his reign onwards it became customary for sick seamen whose disabilities arose from their service to expect treatment and care at the expense of the ship's owner, master or captain.

In medieval times the Navy's primary role was as a transport service when sea voyages were short and confined mainly to British coastal areas. Any casualties could be transferred ashore for attention and there was no pressing need for a surgeon to be carried. The situation altered with the advent of larger warships and longer voyages more men were transported and [illegible] their home ports for years at a stretch.

The first warship to carry broadside guns was the *Mary Rose* but in the minds of naval historians the first battleship of note was Henry VIII's *Grace à Dieu* more affectionately known as the *Great Harry*. Commissioned in 1514 she carried as many sailors as soldiers. The warship marked the beginning of a new era: one of longer sea voyages, larger warships transporting greater numbers of men and one requiring the employment of sea-surgeons.

Towards the end of his reign, Henry dissolved the monasteries and simultaneously the Houses of Piety, the sanctuaries where many invalided and wounded seamen had received rest and treatment. In Elizabeth I's reign, the Spanish Armada was defeated in the Channel by the Queen's seamen but afterwards an epidemic of food poisoning decimated the Fleet and seamen in their hundreds perished by the wayside in the streets of British seaports. Those who survived petitioned the Queen for relief, the outcome of which was the establishment in 1590 of the Chatham Chest. Funded with an income provided by a monthly levy of 6d per head on the wages of every officer and rating.

It was intended that small gratuities and pensions should be provided from this fund to mariners who were no longer able to serve because of their disabilities. Unfortunately applicants for assistance were obliged to apply in person at Chatham and few had the necessary money to make the journey, while others were physically unable to attempt such an exertion. Additionally part of the fund was embezzled and, although matters were eventually resolved, seamen who might have benefited after the Armada were discharged without any financial compensation. Some attempts were made to find them

accommodation in lodgings and taverns many of which were houses of ill repute and any nursing care given was purely coincidental

Conditions improved slightly during the Commonwealth period when additional London hospitals were directed to reserve beds for disabled seamen and the mayors of the naval seaport towns were asked to provide similar accommodation in their local hospital In 1653 the Government appointed a special board known as the Commissioners for the Sick and Hurt who were directed to look after all aspects concerning the welfare of ailing seamen The board made many recommendations for improvements including one for the establishment of naval hospitals but though these suggestions were noted by the Government lack of funds prevented any major building projects and over one hundred years were to pass before the first naval hospital at Haslar was to open its doors

Probably the first real example of true naval nursing was in the person of Mrs Elizabeth Atkin better known as Parliament Joan who during the Civil War of 1642–9 and later during the Dutch Wars selflessly nursed sailors at her own expense Parliament having refused financial assistance for this purpose She finished broken in health and penniless and had to appeal to the Government for a bed in a London hospital As far as records reveal the Dutch Wars provided the first occasion on which the Navy made use of hospital ships during a period of hostilities The vessels were small warships which had been converted to cater for patients and apart from the ship s captain and his crew of seamen they were also complimented for surgeons surgeon s mates and personnel who were termed attendants At the turn of the century it was quite evident that naval surgeons were carried in First and Second rate warships and that they too had assistance with their work since attendants are mentioned frequently in the complement of warships though the Merchant Navy records reveal that the assistant carried was referred to as the surgeon s boy John Woodall who was appointed sea surgeon to the East India Company in 1612 wrote a book entitled *Surgeon s Mate* which gives the reader an insight into the conditions then prevailing at sea As the title might imply a surgeon s mate was also a medical officer but subsidiary in rank to the surgeon The book details the instructions to the surgeon s boy on how to use a syringe which in those days was in frequent use on sick patients for blood letting then considered the panacea

It is interesting to note that at about the same time sailors began to use the nickname loblolly boy to describe the rating who assisted the naval surgeon in his work and it may well be that the attendant or Merchant Navy s surgeon s boy could easily merit the same naval soubriquet as being the description of the duties performed According to the Oxford Dictionary the term loblolly was first used in 1597 and is derived from loh meaning to bubble or boil especially porridge and lolly broth boiled in a pot Then as now sailors were apt to coin new phrases and names and applied loblolly boy to the seamen who were ordered to assist the surgeon because one of their duties was to spoon feed invalids with burgoo a type of maritime porridge seasoned with salt sugar and butter

In the Navy and by the time of the Restoration it had been designated the Royal Navy seamen reigned supreme and anyone who showed inefficiency in seamanship was relegated by the ship's captain to become a waister namely one employed on odd jobs, and who lived in the area of the ship s waist It was from this category of inefficient seamen that a loblolly boy was taken In action he worked well below decks in the cockpit, to which compartment casualties were carried for eventual surgery On other occasions he could be found in the area of the surgeon s cabin making up bandages or powdering chemicals with his pestle and mortar which banging one against the other he also used as an alarm to summon patients to an area for treatment or medicine Like other waisters he was an odd job man but in his case specifically at the surgeon s command So in embryo there appeared the first outline of the future sick berth attendant—today s medical assistant and technician

Peace returned to Britain after the Dutch Wars and with a Dutch prince on the English throne there followed one hundred years of spasmodic wars with France with intermittent periods of peace The demands made on the Navy both in ships and men were constantly increasing from 16 000 men in 1653 to 22 000 in 1702 As demands grew the number of volunteers for naval service proved inadequate and increasing use was made of the ancient Crown right to impress seafaring men a right which at times embraced surgeons As more and more pressed men served the number of loblolly boys increased for the wars were fought in many parts of the world wherever British and French interests clashed from India in the east to Canada and America in the west As well as helping the surgeon loblolly boys would sometimes act in other capacities and it is reputed that at one period Nelson had on board a loblolly boy named Jack Ridet who additionally was obliged to

follow the ship s chaplain around and say Amen in a loud voice at the end of each prayer Others were employed as general messengers labourers and provided they became proficient ship s buglers. It was during this period of intermittent wars that one of the recommendations made by the Commissioners for the Sick and Hurt bore fruit namely with the opening in 1753 of the first purpose-built naval hospital at Haslar Initially the nursing at this hospital was undertaken by women mainly widows of seamen and marines They were sometimes assisted by ex service male pensioners who were normally more accustomed to the manhandling of cannon than the moving of rather fragile patients Neither females nor males had any nursing experience or training and the whole system was unsatisfactory Occasionally too women nursed at sea Although officially they were not allowed to be carried in warships much depended on the opinion of the Commanding Officer and on some occasions women were smuggled on board. Today s well known expressions of show a leg and son of a gun bear witness to these facts and there are many instances of the care they gave to casualties at sea

One of the many outstanding doctors to serve at Haslar Hospital was Thomas Trotter (1760–1832) who had spent some time as a surgeon s mate and who encouraged a number of reforms during his career These included the issue of a regular uniform for naval ratings the provision of lime juice to prevent scurvy and the provision of a separate compartment in warships to house the sick That the views of medical officers were beginning to be heeded was shown by the elevation of naval surgeons to the exalted commissioned rank in 1805 but long before that date one of Dr Trotter s suggestions had already been implemented by Admiral the Earl St Vincent who in 1798 was Commander in Chief of the Mediterranean Fleet He was very keen to institute sick berth compartments in each ship under his command and gave orders accordingly advising on the layout of the new areas These were to encompass the space in the ship s bows formerly containing what was called the manger an area reserved for livestock so that fresh meat and poultry were available for consumption at short notice Dr Trotter had always thought the keeping of livestock in ships was most unhygienic Through this area passed the chimney from the ship s galley on the deck below thus providing the new compartment or sick berth with a form of central heating

At the beginning of the 19th century Earl St Vincent became the First Lord of the Admiralty and in August 1801 he ordered every naval vessel to make provision for a sick berth In First and Second rate vessels it was situated in the ship s bows and in smaller vessels abreast of the main hatchway When the bows of warships became rounded the name sick berth was amended to sick bay the name by which it is known today

Attitudes towards naval medical matters were certainly improving Only a few years earlier one naval officer wrote of his loblolly boy as 'a fellow of some small knowledge of reading and writing who by overhearing the daily clinical lectures of the doctor contrives to pick up a smattering of medical terms which he loses no opportunity of spinning off upon his messmates as sublime wisdom After more experience this officer a Captain Basil Hall RN referring to the same boy in his book of reminiscences *Voyages and Travels* published in 1860 writes of him as one of high intelligence and integrity and a person who has gained the admiration and respect of all manner of seamen aboard

It was not until 1833 however that some official recognition was given to the formation of a Sick Berth category of naval rating This occurred in a directive to commanding officers in the Fleet to establish a Sick Berth Attendant branch in each warship and from that year three new categories appeared in the naval wages table

Assistant Sick Berth Attendant	1s 4d daily (6 6p)
Sick Berth Attendant	1s 9d daily (8 75p)
Sick Berth Steward	2s 5d daily (17 08p)

Small increments were made to the two higher ratings for years of service Kookoo ns badge pay one badge was awarded for five years service two for ten years and three for 15 years When first introduced the badges were worn on a type of ring which the sailors had adopted a blouse or frock as it was known which was worn over ankle length trousers a rig which was officially adopted for every rating in 1857 Promotion was haphazard and depended on local requirements and since there was no professional training recruits had to rely on what they could learn by experience In common with others the sick berth man was first accommodated in a guard or depot ship in one of the home ports before being sent to sea Then at the end of his commission he was supposed to spend a period in a naval hospital ashore (at the close of the 18th century a second hospital had been opened at Plymouth) but this rarely happened as the nursing staff in the naval hospitals untrained females and male service pensioners resented such a practice Invariably therefore the

new sick berth rating found himself back in the guard ship where he carried out menial tasks until drafted to a new warship. It was an unsatisfactory situation which needed investigation but before this was possible war in the Crimea intervened bringing into sharp focus the magnificent work of Florence Nightingale. Her expert nursing and judicious administration reduced the casualty rate from 42 to 2%.

It was hardly surprising, therefore, that her work and that of a dedicated team of naval sisters who also worked in the Crimea under a Mrs Elizabeth Mannaxin led to an investigation into every aspect of the naval nursing system. Under the chairmanship of Rear Admiral Sir A. H. Hoskins a committee examined the problems. Its members included Sir John Watt Reid the then Medical Director General of the Royal Navy, Walter Rind MD, a Fleet Surgeon Compton E. Donville, a naval Captain and Francis M. Clark, Secretary of the Naval Medical Department. They met in June 1883, having visited naval and military hospitals and sought the opinions of naval sick berth ratings as well as those of naval surgeons in particular the latter were asked for their views on the employment of females in naval hospitals. Their recommendations were made to the Admiralty before Christmas 1883 and these were obviously given careful consideration for it was not until 17 October 1884 that an Order in Council disclosed their verdict.

The Order in Council gave details of duties to the sick berth branch and their pay rates:

Boys (2nd and 1st class)	9d daily
Sick Berth Attendant	1s 6d daily
Sick Berth Steward (2nd class)	2s 0d daily
Sick Berth Steward (1st class)	3s 6d daily
Chief Sick Berth Steward	4s 0d daily

Recruiting started at the level of boy rating but few were forthcoming and the Admiralty anxious to achieve a target of 396 sick berth personnel 223 afloat and 173 in the naval hospitals, abandoned the boy entry and allowed Royal Marines to transfer to the Sick Berth Branch simultaneously issuing an amended rating and pay structure:

Probationary Sick Berth Attendants (good ex Royal Marine)	1s 4d daily
Sick Berth Attendants	1s 8d—2s 0d daily
2nd Class Sick Berth Stewards	2s 3d—2s 6d daily
Sick Berth Stewards	2s 10d—3s 10d daily
Chief Sick Berth Stewards	4s 2d—4s 6d daily

In addition three new posts of Head Wardmaster were created and these carried the rank of Warrant Officer. When uniform was introduced officially the boy recruits wore the same rig as a seaman: a blue blouse and collar decorated around its edge with three white tapes, blue trousers and a longish blue cloth jacket which became known as a round jacket. Surmounting as headgear he wore either a straw hat or a blue round cap both of which carried a ribbon bearing the name of his ship but originally without the prefix HMS.

In general terms the Committee decided that on entry sick berth ratings should receive special training and that trained nursing sisters with experience of nursing male patients in civilian hospitals should be recruited. The aim of employing trained nursing sisters as nursing officers in naval hospitals was not only to provide a proper nursing service but additionally to ensure a source of teachers for the newly entered sick berth probationers. Later of course the newly recruited sisters received Royal patronage with their title of Queen Alexandra's Royal Naval Nursing Service. 1884 saw the first entry of sisters and sick berth ratings into the naval hospitals thus replacing the former untrained female nurses and the many ex-Service pensioners. By that date there had been great advances in medical knowledge and changes in the Royal Navy. Sail had given way to steam and a new breed of men was joining the Navy as engineers although in the early days of coal most naval engineering duties were called stokers. Gunnery had advanced too. No longer was the muzzle-loading cannon in use for it had been replaced by a breech loading gun fired from a revolving turret.

The Royal Navy had extended its horizons and was giving greater consideration to the welfare of its sailors. A Naval Discipline Act had been introduced. Flogging had almost disappeared as a punishment, and all ratings had been given an official number and a naval shore depot. Portsmouth, Devonport or Chatham. This meant that he would only move to a ship which operated from that depot and when he returned there he would serve in a shore establishment within the depot which for the sick berth rating meant shore service in one of the three naval hospitals (RNH Chatham having opened in 1905). All these changes had beneficial effects on the family life of sick berth men. The official number of sick berth personnel was prefixed by the letters PM, DM or CM, the P

D and C representing the initial letters—of their depots and the common letter M signifying that they were miscellaneous ratings ie not classed as seamen. The latter distinction occurred in 1891 when the Admiralty decided that sick berth praetitioners should wear the same type of uniform as an engineer apprentice. This was known as fore and aft rig and consisted of a double or single breasted blue cloth jacket with black buttons surmounted by a peaked cap which carried a red embroidered badge. The apprentice or artificer was known as a 'uffy so that a very short time the sick berth probationer acquired yet another soubriquet as sick berth tuffy. As well as loblolly boy he was also known to some as poultice walloper and to many of his messmates because of his medical knowledge...as doc

Initially professional training was of 3 months duration at the naval hospitals at Haslar Plymouth or Chatham (the latter delaying her training of probationers until 1911). Experience proved this period to be too short and it was increased to 6 months before praetitioners were rated sick berth attendants and allowed to wear the red Geneva cross on their uniforms. This period of training was followed by work in a naval hospital before joining a ship. By 1902 the naval hospital at Malta had been allowed a Head Wardmaster Officer and this facility was granted to the naval hospitals at Gibraltar and Portland when they opened. By that time, sick berth personnel had received a small rise in pay actually at the lower rate of SBA an increase of about 1d daily whilst senior ratings were given twice this amount if they were employed in dispensing medicines.

In other paramedical fields such as X ray work operating theatre assistants laboratory work and those proficient as masseurs there were additional increments in pay in addition to being allowed to wear the letter X O L or M on uniform as an identification of specialisation.

Recruiting of probationers in the 20th century remained poor however and did not really improve until the beginning of the First World War. With the introduction of conscription in 1916 an influx of almost 1000 men from the St John Ambulance Brigade Sick Berth Reserve certainly helped to man the new naval auxiliary hospitals and hospital ships. These conscripts had already done annual reserve training with the Navy and could thus be drafted to naval establishments as soon as they were in naval uniform. Nevertheless normal recruitment and training continued apace throughout the war and in 1915 the Medical Department of the Navy produced its first manual of instruction for sick berth staff. Published by HMSO at 1s 6d (7½p) it was sold to the general public and found a ready sale amongst civilian nurses as well as Service nursing aspirants. Over the years the book has been enlarged and amended to take account of new nursing techniques and advances in medical knowledge. The latest edition published by HMSO in 1982 can be bought for £39.70—over 500 times the price of the original handbook which is not only a reflection on inflation but also on the advances which have been made in the realm of medicine since 1915.

Administrative changes occurred in the Branch at the end of the war. In 1918 Wardmaster Officers, in common with other specialist officers were ordered to wear a strip of cloth alongside the gold rings indicating their rank. For naval Warrant Officers this was one gold ring alongside which for Wardmasters the colour designated was maroon. This indication of an officer's specialisation was discontinued in the 1950s except for medical dental and Wardmaster Officers who still as Medical Service officers indicate their specialisation with a colour which is technically listed as salmon pink. In 1918 also the rank of Wardmaster Lieutenant on retirement was given to Wardmasters of certain seniorities whilst a few years later the same rank and the higher rank of Wardmaster Lieutenant Commander was approved for those serving on the Active List. Sick berth ratings too were not neglected and 1920 saw the introduction of leading sick berth attendant (LSBA) sick berth petty officer (SBPO) and sick berth chief petty officer (SBCPO) as replacements for second class sick berth steward sick berth steward and chief sick berth steward respectively.

With the many advances in medical knowledge between the two World Wars, additional paramedical specialisations arose requiring civilian medical qualifications. These included dental attendants (later dental mechanics) and hygiene inspectors. Naval personnel with the required certificates were allowed to wear the letters D DM and H on their uniforms and to receive an increment to their pay. Those qualified as state registered nurses or in mental nursing also had to show their specialisation and in order to avoid any confusion in the letters already worn a revision took place involving a few alterations. The letter R was chosen to represent radiographers thus replacing X for X ray. M replaced P to indicate those qualified in psychiatric or mental nursing. P was used to represent the specialisation of physiotherapy while N indicated anyone qualified as a state registered nurse.

At the outbreak of the Second World War the strength of the Branch was around 1200 in figure

which included about 20 Wardmaster Officers In December 1939 the numbers had increased three fold whilst 3 years later with the global spread of hostilities the increased numbers of warships hospital ships and auxiliary naval hospitals world wide the strength of the Branch was around 7500 of whom 140 were Wardmaster officers

By the end of the conflict, zenith figures of 12000 personnel overall inclusive of 138 commissioned officers were recorded before demobilisation Such numbers had been achieved by the use of hostilities only personnel who since the outbreak of war had been forced to join the services with the call up of age groups the Branch was therefore obliged to employ many men who had no interest whatsoever in nursing yet some proved to be excellent sick bay men They were of course given a shortened professional training in the three home naval hospitals which despite the attentions of the German Luftwaffe remained open in their vulnerable locations throughout the war

At the end of hostilities demobilisation proceeded on a carefully planned programme which gave the Service medical authority time to plan for the future, in fact every branch of the Royal Navy was scrutinised and a special naval team visited every ship to enquire about conditions of service in the various branches From what the team heard it became very clear that the naval sick berth attendant did not like the appellation sick berth nor did commissioned officers favour the name Wardmaster Both titles had lost their original significance and neither were in any way descriptive of their present vocations Eventually therefore with the general accent on better service conditions and improved pay both titles were destined to change A slight alteration came with the abolition of Warrant rank in 1949 when the new generic title of Special Duties was introduced but the Wardmaster title remained as a prefix to the rank e g an officer was described as Wardmaster Sub-Lieutenant (SD)

In 1965 the name Sick Berth Attendant was replaced by either Medical Assistant (MA) or Medical Technician (MT) the latter being reserved for those with paramedical civilian qualifications The name Wardmaster remained and the new rank of Wardmaster Commander was introduced in 1966 as the highest attainable In 1969 51 Wardmaster Officers were asked to give their opinion on their naval description and almost all voiced disapproval Various alternative names were suggested but it was not until September 1972 that official approval was given for the title Wardmaster to be abolished Instead those commissioned in the branch were denoted as Medical Services officers simply abbreviated as (MS) after the officer s naval rank In 1970 the Navy introduced a new rating in every branch known as a Fleet Chief thus bringing into the Service a rank equivalent to a Warrant Officer in the Army and Royal Air Force

Probably the most dramatic innovation was in 1983 with the acceptance into the Queen Alexandra s Royal Naval Nursing Service of male personnel with recognised nursing qualifications some as Nursing Officers and others as ratings the last entirely female preserve to be broached!

Today s Medical Assistants and Technicians with their professional and paramedical qualifications are in great contrast to the loblolly boys of over a century ago Their training not only enhances promotion prospects within the Service but also increases opportunities for subsequent civilian employment in the National Health Service

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The Royal Naval Medical Staff School

R W F Paul, G R Storey P R Wellings and C M Taylor

INTRODUCTION

On 17 October 1884 Queen Victoria signed the Order in Council which established the Sick Berth Branch With the aid of newly recruited Nursing Sisters formal training of Probationary Sick Berth Attendants was commenced The training was organised along similar lines to other branches in the Navy with most of a man's training being given at the beginning of his engagement Although the length of time spent in training was slowly extended over the years and sub-specialist training initiated in 1920 the style and approach to training remained unchanged until 1965

In 1965 the Sick Berth Branch became the Medical Branch and was sub-divided into Medical Technician and Medical Assistant Both categories continued to receive the basic medical training of 20 weeks duration after which the Technician commenced three years specialist training and the Medical Assistant 32 weeks naval sub-specialist training The Technician was awarded civilian qualifications he had restricted sea billets and was advanced by time On the other hand the Medical Assistant was unable to obtain civilian qualifications because there simply were none appropriate to his naval task he had greater drafting turbulence and he had much poorer advancement prospects

With the introduction of complex new weapon systems during the 1960s, it became all too evident that the basic training package had to be supplemented by the addition of more specialised packages throughout the man's career so that he could meet each subsequent operational requirement In 1969 HMS *Collingwood* introduced the Royal Naval Training System It was called objective training and although its principles were not widely accepted at first a sign of its excellence is that each training command has now developed an almost identical system

In 1975 the Director of Naval Medical Staff Training enlisted the aid of the Naval Manpower Utilisation Unit and a job analysis questionnaire listing several hundred tasks was sent to every Medical Branch rating Objectives were established from this data and then discussed modified and finally agreed with the users the doctors medical services officers and nursing sisters who were to employ and oversee the Medical Branch rating in his various roles Although much was done the full impetus for change did not come until 1979 when the Training Division, Haslar was brought under the control of Commander-in-Chief Naval Home Command and a renamed Royal Naval Medical Staff School was restyled along the lines of other establishment training schools. Objective training was introduced with a newly formed training design team producing instructional specifications whilst a training execution team decided how best to give that instruction with the resources a training support team could make available Perhaps the two most notable contributions of the 1975 questionnaire have been the Senior Rates Professional Qualifying Course (SRPQC) and the fundamental revision of BR 888 Since then progress has been rapid and amongst many other changes the introduction of the Leading Medical Assistants Professional Qualifying Course (LMAPQC) much of which is based upon the lessons learned from the Falklands conflict and the findings of a Falklands medical task questionnaire has been a particularly worthwhile achievement

Objective training is not a static concept Quality control is vital to the system Continuous evaluation or internal feedback from both staff and trainees within the School, provides the fine tuning that keeps the training objectives on course, whilst validation or external feedback from the users provides any necessary alterations in their direction Thanks to the introduction of the Royal

Naval Training System the Medical Branch rating now receives packages of training throughout his career to fit him for his different operational tasks

PART II TRAINING

Having carried out an induction training period of 6 weeks at HMS *Raleigh* Probationary Medical Assistants and Technicians come to the School for Part II training In 1975 computer analysis of this training showed that in certain areas too much was being taught too soon and so the module was reduced from 20 to 17 weeks mainly by transferring Medical and Surgical Conditions to Part III training

The module was further reduced to 13 weeks in 1983 in order to provide compensating reductions for the introduction of the Leading Medical Assistant Professional Qualifying Course which by assimilating some of the subject matter also had the benefit of further spreading the training load more evenly throughout the man's career

Part II training is largely theoretical and the subjects covered are anatomy and physiology nursing, first aid NBCD training, health and hygiene Service administration and medical storekeeping and pharmacy

On successful completion of this module the Red Cross branch badge is awarded and the Medical Assistant passes on to Part III training whilst the Medical Technician starts his 3 year specialist training

PART III TRAINING

Part III training was introduced in 1965 and was of 32 weeks duration The Naval Medical Assistant who was to be employed on general duties spent this time in practical ward training Medical Assistants who were to join submarines the Commandos or the Fleet Air Arm had a lesser period of training on the wards the remainder of their 32 weeks being made up by sub-specialisation training Unfortunately ward training was largely unplanned with the result that the Medical Assistant was rarely moved from ward to ward to gain experience and he was often employed on the more menial non nursing duties In comparison with his nurse counterparts his training in the nursing process was inadequate and accordingly Part III training was reorganised in 1975 so that all Medical Assistants could receive 32 weeks ward experience Sub-specialisation training was therefore removed from the syllabus Diseases and Treatments were added but of most importance a clinical teacher was placed in charge of Part III training His task was to coordinate training in the various wards and departments of the hospital and to provide 10 five separate blocks of one week each the theoretical instruction necessary to consolidate what had been taught on the wards

In addition a 1 week sick bay acquaint was given a further week was spent with the Hampshire Ambulance Service and on job training task books were introduced As a result of the introduction of Part IV establishment training and the lessons learned from the Falklands conflict the sick bay acquaint was replaced in 1983 by a 1 week module on the treatment of burns at the Queen Elizabeth Military Hospital Woolwich

Part III training standards are now on a par with those in nurse training and on successful completion of written examinations and practical assessments the Medical Assistant qualifies for the City and Guilds Basic Medical Services Certificate and is eligible to apply for Associate Membership of the Association of Emergency Medical Technicians

PART IV TRAINING

Reductions in the size of the Fleet and the closure of some shore establishments have resulted in the loss of billets that were important on job training areas for newly qualified Medical Assistants Consequently many could spend their first few years in the Service working in hospitals before finding out what life in the Navy was really about In January 1983 a Part IV establishment training module of 6 months was introduced the on job training task book was revised to include establishment tasks and during this period the genito urinary medicine and portable X ray courses have also to be completed

With Part IV training behind him the Medical Assistant is now fully prepared to serve as a member of a medical team ashore and afloat or if selected to go on for sub-specialisation training in the submarine programme or with the Commandos

SUB SPECIALISATION TRAINING

The specialised training of Submarine and Commando Medical Assistants is the responsibility of those Commands However all must complete the career courses at Leading Medical Assistant and Senior Rate level, and submarine medical ratings now also attend Pre Joining Training Courses (PJTC) for service afloat Submarine base or Commando unit medical centres are responsible for their own ongoing medical training, assisted as necessary by the Royal Naval Medical Staff School

CONTINUATION TRAINING

In 1980 the SRPQC was introduced and the LMAPQC in the Spring of 1983 However regular updating in the latest techniques of advanced casualty care is still required during the last 10 years or so of the senior rate's career As from 1985 therefore all senior Medical Branch and QARNNS ratings will be required to return to the RNMSS every 3 years for a combat casualty care weekend workshop which will also requalify them as first aid instructors (See SRPQC below) The flow diagram shows the pattern of training throughout a career of 22 years which has been designed to help the Medical Branch rating over the advancement hurdles to provide the incentives of civilian recognition and above all to ensure that he is always expert in the techniques of combat casualty care

Leading Medical Assistant Professional Qualifying Course

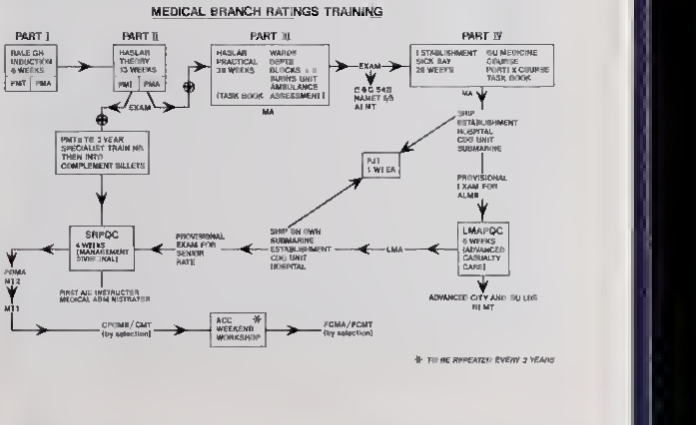
The LMAPQC is divided into 3 modules of 2 weeks The first module is designed to give the general duties knowledge and bring out the leadership qualities expected of a leading hand The second module is largely based on Falklands experience and covers the theoretical aspects of advanced casualty care. The final module the practical aspects of advanced casualty care is carried out in civilian hospitals under the control of Royal Naval Reserve anaesthetists where they are expected to perform about 25 intubations and put up some 50 intravenous lines

On successful completion of all 3 modules by both examination and practical assessment, the Medical Assistant is awarded the City and Guilds Advanced Emergency Care Certificate and may apply for Registered Membership of the Association of Emergency Medical Technicians

Senior Rates Professional Qualifying Course

It is at this point that the Medical Technician and Medical Assistant training programmes link together again This 4 week course has recently been extensively revised with the aim of enhancing management and divisional skills and will include modules in hospital and practice administration occupational health instructional technique and the use of computers

The course has been open to QARNNS ratings since January 1984 and its successful completion entitles students to a first aid instructor's qualification and negotiations are under way to introduce a City and Guilds Medical Administrator's Certificate by the end of this year



Pre-Joining Training for sea service

Medical Branch ratings received no formal training prior to sea service before 1971 when the PJT course was introduced. Much of this theoretical and practical instruction has now been included in the LMAPQC and the PJT course is to be reduced to 2 weeks by 1985. The new course will contain updates on combat casualty care, advice on alcohol abuse and welfare counselling.

LESSONS LEARNED FROM OPERATION CORPORATE

Although the School's first priority has been the professional career package for the Medical Branch ratings, much effort has also been put into other aspects of medical training in the light of the lessons learned in the South Atlantic and from a Falklands questionnaire. These include first aid training, Royal Naval Reserve training and the updating of training films.

In August 1982 a questionnaire was issued to all Medical Branch personnel who had served in the South Atlantic during the Falklands conflict. It listed numerous tasks asked how often these tasks were carried out during the campaign and how well trained they had been in that task. Of 269 questionnaires distributed, 166 were completed and returned for analysis.

Computer printouts on the questionnaire responses have been evaluated and changes to training made accordingly. In general the training was assessed as good. However there were shortfalls in the training for the treatment of burns, smoke inhalation casualty handling and certain combat casualty skills such as intubation and fluid replacement. All these areas have now been updated.

FIRST AID TRAINING

First aid training used to be on a do it yourself basis and its success depended upon the interest of the medical staff carrying it out. In 1975 the First Aid School at *Phoenix* was opened and taught a standardised first aid package for which the St John Ambulance certificate was awarded. Two other first aid schools have since been set up at HMS *Raleigh* (1978) and HMS *Cochrane* (1981) to meet the requirement to train 10% of ships' companies.

In 1981 the RNMSS was made the lead school for first aid and by 1982 the original syllabus had been completely rewritten to give four levels of first aid training—the New Entry, the First Aider, the First Aid Party and the Medical Branch rating. After 9 months of validation in the first aid schools and with a post Falklands update, the new syllabus was issued in July 1983 to all establishments and large ships carrying a medical officer.

The new syllabus is of 4 days' duration and is approved to Health and Safety Executive standards so that MOD civilians can also be trained. Together with newly made casualty training films a wallet of about 150 slides and other training aids this package will standardise first aid training throughout the Royal Navy and Royal Naval Reserve.

The first aid schools are responsible for training seagoing personnel. Each establishment however is responsible for training its own 10% of complement and because it will take some time for Medical Branch senior rates to qualify as first aid instructors via the SRPQC first aid instructor weekend courses are being held at the RNMSS. An additional-to-complement first aid instructor will act as a mobile advisor throughout the RN and RNR during 1984 to assist in setting up establishment and divisional first aid training.

ROYAL NAVAL RESERVE TRAINING

Medical Assistant and Medical Technician training packages for the RNR follow the RN Medical Branch training packages outlined above and have recently been introduced.

From 1 January 1984 RNMSS personnel have been made available to attend the RNR Divisions to advise on and carry out the training in first aid. Furthermore suitably qualified RNR personnel will be invited to attend RNMSS for a 9 day first aid instructors course which will enable them to carry out the continuation training in the Divisions and the communications training centres.

THE FUTURE

The quality of training depends upon the resources and training aids available to it. Both the image and the facilities for training will be considerably improved when the RNMSS moves into its new accommodation in a refurbished sick officers' block within the hospital in 1985. The administration of the School and much of the routine time-consuming detail associated with training is now being simplified by the use of the new Equinox micro-computer with its five terminals. The recent acquisition of closed circuit television equipment is allowing the School to make its own in-house filmlets on medical nursing and first aid procedures. In addition work has proceeded on the following professionally made training films:

a. *Casualty Handling*. The new film 'Handle Him with Care, Part 2' was issued to the Fleet in July 1983 as part of the new first aid package. It won

the Bronze Award in the Medical Category at the New York Film and Video Festival

b *Breath of Life* The original film which was made in 1980 has recently been updated and retitled 'The ABC of Cardio-Pulmonary Resuscitation'

c *Management of Burns Parts 1 2 and 3* These films were distributed in 1978 and are at present being remade in two parts in the light of the Falklands experience Part 1 will show the immediate and intermediate treatment of burns and smoke inhalation in naval scenarios. Part 2 will show the principles and treatment of these conditions in hospital

d *Advanced Casualty Care Skills* A training film is required to accompany the LMAPQC and discussions for a film on advanced casualty care have taken place with the British Association for Immediate Care Schemes

CONCLUSION

The Medical Assistant is a unique sort of person He is given positions of medical responsibility early in his career and as a Leading Hand can be in sole charge of his own department at sea and is expected to be able to diagnose treat and stabilize a patient until a transfer can be arranged Outside the Ministry of Defence it would be illegal to teach him the diagnostic and therapeutic skills he requires to perform his naval task.

An immense amount of dedicated work has gone into improving the training standards widening the horizons and rewarding the accomplishments of the Medical Branch rating and the School is deeply conscious of the fact that much of what has been done today would not have been possible without the preparation of yesterday—standing on the shoulders of one's predecessors only helps one to see further if both are facing in the same direction It has, however been a labour of love with the thrust coming from the desire to get it right and nothing has been more gratifying than to hear from the old and bolds the wish that they had been offered the same opportunities

NURSE TRAINING

Caring and the nursing process today depend upon being taught to recognise both the needs and the best interests of the patient And so whilst dealing with the facts associated with the introduction of the United Kingdom Central Council and the recent changes to the Queen Alexandra's Royal Naval Nursing Service–it is appropriate to dwell a little upon dispelling some of the mis conceptions surrounding the extended role of the clinical nurse

The United Kingdom Central Council

In July 1983 the General Nursing Councils were abolished and other institutions, such as the Central Midwives Board were dissolved and all were replaced by the United Kingdom Central Council for Nursing Midwifery and Health Visiting the day-to-day organisation being administered through its English Scottish Welsh and Northern Ireland National Boards

The UKCC has proposed many radical innovations most of which are still under discussion However the several professional registers that formerly existed have now been replaced by a single professional register and although only so far at the proposal stage all nurses may be required to register periodically with the payment of a fee and may have to satisfy the Council every 5 years that active and appropriate steps to further their professional development have been taken In addition if they leave nursing for more than 2 years and wish to return an obligatory reorientation scheme may have to be undertaken

At grass roots level the State Registered Nurse has been retitled Registered General Nurse and the State Enrolled Nurse has become the Enrolled Nurse (General)–this ironically at the same time as QARNNS titles have been changed to for example Leading SKN and Petty Officer SEN in order to reflect their qualifications

The Royal Navy School of Nursing

Because of the recent reduction in the number of beds in Naval Hospitals the range of experience available to nurse learners was becoming limited to the point where recognition of the School could have been withdrawn and similarly reduced recruiting levels would have meant that the numbers were also below those required for recognition as a training school Fortunately the School was able to amalgamate with the Portsmouth School of Nursing at Queen Alexandra's Hospital, Cosham to form the Portsmouth District and Royal Naval School of Nursing and the first naval learners entered the new School in January 1983 About five learners start training every 3 months Academic work is mainly carried out at Cosham with the general clinical work being undertaken in Haslar with specialist secondments elsewhere Royal Naval tutors assist in teaching the mixed classes of civilian and naval learners to both RNH Haslar and Queen Alexandra's Hospital Cosham

Post basic study afternoons are being held to keep nurses up to date on professional subjects and courses are run to extend the clinical role of the trained nurse An expanded and redesigned Staff Nurses Management Module has been introduced to ensure a thorough grounding in both management and leadership as well as in nursing and Service matters

The Unified Nursing Service

On 1 April 1983 the Unified Service was introduced and male nurses were given the opportunity of transferring to the QARNNS which is now responsible for all state recognised post-registration training New entry ratings to the QARNNS both male and female carry out Part I training at HMS *Raleigh* and are then subject to the same professional examinations and selection boards as the Medical Branch intings

The Extended Role of the Clinical Nurse

From the many recent changes that have taken place in the Naval Nursing Service the scheme of the extended role of the clinical nurse has perhaps caused most misunderstanding.

The International Council of Nurses has defined a nurse as a person who has completed a programme of basic nursing education and who is qualified and authorised to practise nursing Broadly speaking that means that if a procedure has not been formally taught the nurse is not competent to carry out that procedure and would be considered negligent if she did so Some years ago the nursing profession realised that nurses were often undertaking clinical tasks for which they were not trained and a working party was set up to look into the matter and identify the areas of clinical practice in which the role of the nurse was extending in relation to that of the doctor

As a result, it was agreed that both the service to the patient and the job satisfaction of the nurse would be improved if the nurse undertook certain activities outside the traditional role—but on an official extended role list—provided that three principles were satisfied They were that the nurse must be specifically trained to carry out the task that the task must be authorised and that the nurse must positively agree to perform the task When these criteria have been met the nurse is deemed to be competent and responsible for her actions but she is not immune from allegations of negligence or malpractice

The official extended role lists differ amongst the various health authorities, eight procedures being authorised by the Ministry of Defence (Navy) These tasks are divided into two groups The first is for all newly qualified RGNs who in their post-basic study block are taught the toilet and suture of simple wounds venepuncture and the addition of drug additives to pre-existing intravenous infusions The second group is for any naval nurse who is about to take up a new appointment which has specialised tasks Subject to her agreement and as appropriate to her new duties she may be taught the topping up of epidural analgesia the application of certain plaster of Paris casts defibrillation vaccination and the dispensing of prescribed manufactured drugs in RN sick quarters

Details of this training are entered in a register and in the nurse's own personal certificate of competence After a period of supervised practice in the new appointment the nurse can then be assessed as competent by a superior and her certificate noted accordingly

The extended role of the clinical nurse must not be seen as diminishing the role of the doctor or of relieving him of the more mundane and time consuming tasks. Its prime purpose is to provide an improved service to the patient and with proper delegation within the scheme will help to protect both the individual and the Service from the risk of accusations of negligence whilst protecting the patient from the likelihood of mishap in the first place

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An interim report on highly selective vagotomy in the Royal Navy: early return to duty

E P Dewar

Summary

Highly selective vagotomy (HSV) is the newest of the surgical treatments for peptic ulcer disease. The effectiveness of HSV in comparison with the more traditional operations and the research carried out to demonstrate this are discussed.

The four year period during which HSV became the elective surgical treatment for duodenal ulcer at the Royal Naval Hospital Haslar has been analysed and reveals that HSV results in a considerable reduction in the time before a Serviceman is fit to return to full duty in medical category P2.

BACKGROUND

The traditional operations used in the treatment of duodenal and gastric ulcers have included Billroth 1 partial gastrectomy, Polya partial gastrectomy, truncal vagotomy and antrectomy, truncal vagotomy and pyloroplasty and truncal vagotomy and gastrojejunostomy.[1–3]

The gastrectomies involve resection of varying amounts of the stomach and disruption or by pass of the pylorus. The truncal vagotomy procedures render the stomach atonic and require a drainage procedure such as pyloroplasty or gastrojejunostomy.[2] It is well recognised that although these operations cure the ulcer, albeit with varying rates of success, they are associated with a number of complications, both early and delayed, in a significant proportion of cases.

The early post operative morbidity is related to the fact that

(a) The gastrointestinal tract must be opened to all these procedures with consequent anastomotic suture lines.

(b) A nasogastric tube must be used post operatively adding to the discomfort of the patient and an increased risk of chest infection.

(c) return to normal oral nutrition is delayed.

(d) the length of stay in hospital is prolonged.

The late complications are related to the disruption of the normal anatomical and physiological status of the G I tract and are commonly grouped together as the post gastric surgery or post-gastrectomy syndrome.

These problems may manifest themselves as dumping, diarrhoea, heartburn, weight loss, anaemia, early satiety, bilious vomiting, blind-loop syndromes and bile reflux gastritis.[4–10, 14]

In addition there is a certain mortality rate associated with these operations, the greater if gastric resection is involved than if just a drainage procedure is performed.[13]

In 1970 the operation of highly selective vagotomy (HSV) or proximal gastric vagotomy was pioneered in this country by Professor David Johnston in Leeds.[16] In the following years it has gained wide acceptance throughout the British Isles and Europe. It has been in excess of 10 years for the operation to gain acceptance in part because of the understandable reluctance of many older surgeons to alter the method of a lifetime. They will have become familiar with a particular operation which in their hands produces acceptable results in a majority of cases.

In order to break down the barriers of surgical tradition highly selective vagotomy has had to undergo detailed evaluation by many centres. A great deal of research work and a multitude of papers have resulted.[1]

INTRODUCTION

At the Verdun on Vagotomy Symposium in February 1981 most of the top gastro intestinal surgeons in Britain and Europe weighed up the

evidence presented on behalf of HSV and after due deliberation delivered a verdict of case proven in favour of that operation as being the treatment of choice in the case of elective surgery for duodenal ulcer.[17] Many however reserved judgement on its value in the treatment of gastric ulceration being of the opinion that Billroth I partial gastrectomy had withstood the test of time as an effective cure for gastric ulcers (Theodor Billroth had performed the first such operation on 29 January 1881).

The results of many studies comparing HSV with all the other procedures used in the treatment of duodenal ulcer have shown that it is just as effective an operation in curing the ulcer. It is now accepted that the recurrence rate is no greater than after truncal vagotomy with a drainage procedure and that the mortality is lower than that associated with all the other operations.[2 8 20]

The incidence of dumping, heartburn, bilious vomiting, weight loss and anaemia is significantly less after HSV. Post vagotomy diarrhoea has virtually been eliminated by HSV and the blind loop syndrome is of course non existent. Early satiety may be present for up to 3 months after HSV but it is usually the case that most patients are able to eat full meals after this time which is often not the case after a partial gastrectomy.[20]

The one piece of evidence that was lacking was whether or not HSV reduced the incidence of duodenogastric reflux. Some studies[14 21] had suggested this to be the case in the fasted patient but no good study had been performed to assess duodenogastric reflux in both the fasting and postprandial state in order to compare HSV with the other more traditionally performed operations.

The significance of duodenogastric reflux is not only related to the possible development of gastritis and the bile reflux gastritis syndrome[21 22] which is a well recognised complication of the operations which by-pass or destroy the pyloric sphincter but also because bile reflux has been implicated as a causative factor in the increased risk of development of gastric cancer in patients who have undergone partial gastrectomy or truncal vagotomy and gastroenterostomy for benign peptic ulcer disease.[3] This risk is now assessed as being 5·6 times greater 20 years after surgery than in the non operated patient.[4 26]

It has now been shown that highly selective vagotomy when used in the treatment of both gastric and duodenal ulcers does result in significantly lower concentrations of both bile acids and lysolecithin in the stomach in the fasting state and after a test meal than those found after Billroth I gastrectomy, Polya partial gastrectomy, truncal vagotomy and pyloroplasty and truncal vagotomy and gastrojejunostomy.[27 28] Also the peak levels of refluxing bile acids were significantly less after HSV than after the other operations. In addition the duration of exposure of the gastric mucosa to the irritant action of bile acids and lysolecithin is significantly less after HSV than after all the other procedures.[27 28]

Indeed the reflux of bile acids and lysolecithin was less after HSV than in pre operative duodenal ulcer and gastric ulcer patients and in fact approached the levels found in normal controls.

In addition there is now evidence that the gastritis which is present in all pre operative duodenal and gastric ulcer patients does not progress significantly after highly selective vagotomy whereas it is seen to get worse especially in the proximal stomach after partial gastrectomy or truncal vagotomy and drainage.[29 30]

We could hope perhaps that in the long term HSV will be a safer operation without the increased risk of gastric cancer—which is associated with increasing severity of gastritis—and also that the incidence of bile reflux gastritis, which is very much less after HSV than any of the other operations will remain low even after long term follow up.

HIGHLY SELECTIVE VAGOTOMY IN THE ROYAL NAVY

Details of patients

On the basis of the research and clinical results described above highly selective vagotomy was introduced into the Royal Navy initially in 1976 as one of the elective surgical treatments for duodenal and gastric ulcers in both Service and civilian patients.

It was not until 1980 however that it became the operation of choice for the elective treatment of duodenal ulcers at Royal Naval Hospital Haslar. Up until this time the surgeons practising peptic ulcer surgery in this hospital were experienced in truncal vagotomy with a drainage procedure and partial gastrectomy but not in highly selective vagotomy. Consequently and quite correctly very few highly selective vagotomies had been performed. During the late 1970's in Haslar truncal vagotomy and gastrojejunostomy was the treatment of choice for duodenal ulcer, truncal vagotomy and antrectomy for the hypersecretors and Billroth I partial gastrectomy for gastric ulcer.

Methods

Since 1980 the majority of elective peptic ulcer surgery has been performed using highly selective

vagotomy according to the method previously described [1]. The treatment of emergency cases—bleeding and perforation—has varied between the use of HSV and non-HSV operations depending on the decision of the surgeon at the time of operation.

RESULTS

Operative statistics

The figures relate to operations performed for duodenal and gastric ulceration between January 1978 and December 1981. These four consecutive years have been divided into two equal time periods of two years—January 1978–December 1979 and January 1980–December 1981.

In 1978 and 1979 there were 81 operations performed in RNH Haslar for the elective and emergency treatment of duodenal and gastric ulcers (DU and GU) (Table I). Only eight of these were highly selective vagotomy (HSV), the other 73 (35 elective, 38 emergency) comprising Billroth I partial gastrectomy, Polya partial gastrectomy, truncal vagotomy and antrectomy and truncal vagotomy with either pyloroplasty or gastrojejunostomy—the non-HSV group.

In 1980 and 1981, 79 operations for peptic ulceration were performed of these, 53 were HSV and only 26 were non-HSV. On only five occasions was a non-HSV operation chosen as the *elective* operation, the other 21 being performed for emergency treatment.

Only five of the HSV's were performed for emergencies. Thus in the elective treatment of DU and GU, HSV was used on 48 occasions and a non-HSV operation on only five occasions.

This change in policy from non-HSV to HSV in the *elective* treatment of DU and GU over the two successive periods is well illustrated by the fact that 18 per cent of operations in 1978–79 were HSV whereas 91 per cent of the operations in 1980–81 were HSV.

The overall figures (elective and emergency) were 10 per cent HSV 1978–79 and 67% HSV 1980–81. The lower percentages in the overall group reflect the fact that for emergency procedures non-HSV operations are still carried out more frequently than HSV. However these numbers include patients in whom a perforated ulcer was treated only by simple closure—no definitive procedure being carried out. All five emergency HSV's and 43 of the 48 elective HSV's were performed by E.P.D. who was the surgeon most experienced in the use of HSV.

Clinical implications

The normal uncomplicated post-operative course for patients who have undergone a partial gastrectomy or truncal vagotomy and drainage procedure in the treatment of DU is that a nasogastric tube remains in place for approximately 5 days—with all its associated patient discomfort and possible complications—and following its removal the patient's diet is gradually increased over the next 5 days. Thus there was a minimal stay in hospital of 10 days. After this the Service patients received 4–6 weeks hospital sick leave before being discharged in the reduced medical category P7R for 6 months. At the end of this time they were normally upgraded on review to full duty category P2.

Thus the overall lost personnel effective period (LPEP) defined as the length of time from operation until fully fit (P2) to return to the Fleet was in excess of seven months. The minimum time was over 29 weeks and this may extend to 31 weeks if six rather than four weeks hospital sick leave were granted (Table II).

The normal uncomplicated post-operative course for patients who have undergone highly selective vagotomy to treat their duodenal ulcer is that they do NOT have a nasogastric tube post-operatively thus avoiding the discomfort and associated complications. The diet is gradually increased during the first 5 post-operative days and on either the fifth or sixth post-operative day the patient was able to leave hospital (a saving of 4–5 days hospital stay time). The Service patients required only three weeks hospital sick leave (a saving of between 1 and 3 weeks) before being discharged in the reduced medical category P7R.

Table I Operations for peptic ulceration (DU and GU) 1978–81

	1978–79		1980–81	
	Elective	*Emergency*	*Elective*	*Emergency*
HSV	8	0	48	5
Non-HSV*	35	38	5	21

*Includes 8 with 1 partial gastrectomy, Polya partial gastrectomy, truncal vagotomy and antrectomy, truncal vagotomy and drainage.

Table II Length of time from operation until return to Full Duty P2 in servicemen undergoing operative for duodenal ulcer

	Time (days)		
	Treatment by HSV	Treatment by non HSV	Saving in time to full duty
In-patient stay	5	10	5
Hospital sick leave	21	28–42	7–21
Downgraded medical category	84	168	84
Total days	110	206–220	96–110

for three months (12 weeks). They were reviewed at the end of this time and were all fit to be upgraded to full duty category P2 (a saving of three months in the reduced medical category).

Thus the overall LPEP was less than 16 weeks after HSV (Table II). It can be seen therefore that a Service patient was effectively unable to carry out his full normal duties and was not available to serve at sea for just under *16 weeks* after highly selective vagotomy compared with just over *29–31* weeks after a non-HSV operation—a saving in each Serviceman of just over 13–15 weeks (96–110 days) (Table II).

Service Implications

In terms of the number of servicemen (RN and RM) who underwent HSV for the elective treatment of duodenal ulcer alone during 1980–81 who would otherwise have had a non HSV operation it can be calculated that the lost personnel effective period was reduced by 7·7 years. This represents a saving of between 2457 and 2935 man days for the 27 servicemen who had their duodenal ulcer cured by HSV in the two year period 1980–81.

DISCUSSION

Not only is the Royal Navy benefiting by getting its own personnel back to full duty in a medical category P2 so much sooner after HSV than after the other operations but also the civilian patients only stay in hospital for half the length of time after HSV than they would after a non HSV operation. Thus a further saving in cost with regard to inpatient treatment is effected.

Apart from the early post operative period that is until being upgraded to medical category P2 there should be a future saving in terms of out patient review appointments and possible future hospitalisation because, as has been stated earlier HSV is attended by less post gastric surgery complications than the other operations. Indeed to date all the Service patients have had good results from their operations and are classified as Grade I or 2 according to the modified Visick grading[6].

The one proven recurrent ulcer in the limited follow up period (to October 1983) has occurred in a civilian who is taking anti inflammatory drugs.

CONCLUSION

The operation of highly selective vagotomy is more acceptable to the patient, has a lower mortality and morbidity and is as effective curative operation for peptic ulceration[7,8]. The introduction of this operation into Royal Naval surgical practice at RNH Haslar has resulted in considerable economy of both time and money not only to the Royal Naval Medical Service, in terms of length of hospitalisation but also to the Royal Navy as a whole in terms of personnel effectiveness.

ACKNOWLEDGEMENT

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Osteitis pubis as a mimic of prostatic pain

I L Jenkins D M Crean and A C Buck

Summary

Thirty five patients with pain suggesting a prostatic origin but with no evidence of active prostatic inflammation presented between 1979 and 1982, and were diagnosed as having osteitis pubis

The clinical presentation diagnosis and treatment of osteitis pubis are presented together with the results of treatment

INTRODUCTION

Pain may be a feature of prostatic inflammatory disease and is experienced supra pubically in the perineum the inguinal region and the testis either in isolation or in any combination (*Fig* 1) A significant number of patients present, however with pain suggesting a prostatic origin in whom there is no evidence of active inflammation of the gland

Osteitis pubis can frequently be a case of pros tatic pain

PATIENTS AND METHOD

A total of 35 patients aged 18 to 44 years mean 29 years presented between 1979 and 1982 with pain suggesting acute prostatitis but without evidence of active prostatic inflammatory disease and were investigated and diagnosed as having osteitis pubis Three patients had previously been treated for acute prostatitis one had undergone an warranted orchiectomy and one a transurethral resection of the gland before referral and one an adductor tenotomy Active inflammatory disease was excluded in each case by the absence of a significant number of inflammatory cells a pH of 6 8 or less[1] and by the absence of bacterial pathogens in the expressed prostatic secretion

Osteitis pubis was diagnosed by local tenderness over the symphysis together with radiological changes and increased Technetium labelled MDP uptake by the pubis

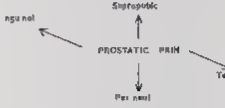

Fig 1 Distribution of prostatic pain

Radiological examination

In addition to supine x ray of the pelvis and sacroiliac joints and coned views of the pubis, stress or flamingo views were taken to exclude instability of the symphysis These are postero anterior projections of the pubis while weight bearing on each leg in turn

The radiological features of osteitis pubis are a width of the symphysis greater than 10 mms marginal irregularity and erosion of the symphysis with reactive sclerosis and instability of the symphysis as demonstrated by a step of more than 2 mms in the level of the superior pubic rami[2–4] either alone or in combination (*Figs* 2–4)

Bone scan

15mCi ^{99m}Tc MDP (Amerscan) was injected intravenously The patient was examined three hours later immediately after voiding, using a gamma camera and evidence of increased activity in the region of the symphysis pubis was considered to confirm the diagnosis of osteitis pubis (*Fig* 5)

Treatment

Treatment was designed to reduce the local inflammatory response by oral anti inflammatory drug to increase the local blood supply by ultrasonics and to stabilise the pelvis by overcoming any

Fig 2 X-ray features widening of symphysis pubis.

Fig 3 X-ray features erosion and sclerosis of symphysis pubis

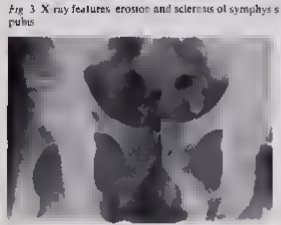

Fig 4 X-ray features step-[illegible] pubic ram[illegible]

Fig 5 Bone scan increased uptake of isotope in region of the symphysis pubis

dyssynergy of the local muscle groups by aggressive pelvic floor and lower abdominal muscle exercises or ultimately by surgical fixation

RESULTS

Of the 35 patients diagnosed as having osteitis pubis all had pain in one or more sites 27 had perineal pain 13 testicular pain 12 supra pubic pain five inguinal pain and three had post-ejaculation scrotal perineal discomfort (Table 1)

There were no diagnostic radiological features in eight patients (23%) but individual or combined features were present in the remaining 27 Erosions of the symphysis were present in 18 a significant step in the levels of the superior pubic rami in 12, widening of the symphysis in seven and marginal sclerosis of the symphysis in four (Table 2) ^{99m}Tc MDP bone scan was positive in all cases

Following treatment significant symptomatic improvement was present in 34 patients 22 having total resolution of their symptoms Two patients suffered subsequent relapse but successfully responded to a second course of treatment One patient failed to respond to treatment and underwent arthrodesis of the symphysis but this was not successful due to a complicating local infection (Table 3)

Table 1 Pain distribution in 35 patients

PAIN	NUMBER	PERCENTAGE
Perineal	27	77
Testicular	13	37
Suprapubic	12	34
Inguinal	5	14
Post-coital	3	9

Total 35 patients

Table II Symptoms in 35 patients

SYMPTOMS	NUMBER	PERCENTAGE
Pain	35	100
Stiffness	12	34
Weakness	7	20
Morning stiffness	4	11
None	8	23

Figures are numbers of patients

Table III Progression in 35 patients

PROGRESS	NUMBER	PERCENTAGE
Symptom free	22	63
Symptoms improved	9	26
Relapse	2	6
No improvement	1	3

Total 35 patients

Key: both subsequently symptom free

DISCUSSION

Pain suggesting a prostatic origin with or without disturbance in flow but in the absence of objective evidence of prostatitis is a frequent problem for the urologist. Osteitis pubis is a not uncommon condition well recognised in active participants in strenuous sports and exercise [1-4]. It may present to the rheumatologist as an activity aggravated condition or to the urologist as a mimic of prostatic pain.

Osteitis pubis is an enthesitis defined as an acute inflammatory reaction affecting the Sharpey's fibres at the site of muscle or muscular tendinous attachment to bone. Essentially the whole pelvic floor complex can be considered as an aponeurosis and consequently be susceptible to an enthesopathy. There is a significant association with other inflammatory conditions and 10% of patients with ankylosing spondylitis will have changes in the symphysis.

Ironically osteitis pubis was encountered historically largely by the urologist as a complication of lower tract surgery in the presence of infected urine. The condition became somewhat unimportant following the introduction of antibiotics but has again become widely recognised with the increased physical demands of professional sport the increasing popularity of amateur sport and the relatively recent advent of investigative sports medicine. A number of aetiological factors have been postulated including infection and osteonecrosis sub-chondral trabecular fractures, and mechanical shearing factors with instability of the symphysis [5] but no single isolated cause can be implicated. Most evidence suggests that osteitis pubis is the result of repeated minor strains over a long period of time [4].

Histological examination of biopsy specimens taken from the site of muscle-bone attachment demonstrates typical acute inflammatory changes with cellular infiltration.

The pain experienced is attributable to the local acute inflammatory reaction and to the consequential and associated dyssynergy of the muscles of the pelvic floor. In addition, associated reduced urinary flow sometimes seen in patients with suspected prostatic pain but in the absence of infection is thought to be related to pelvic floor dyssynergy involving hypertonia in the pubosphincteric striated mechanism. This effective bladder outflow obstruction has been reported by Osborn *et al* [6] who rationalised drug treatment by alpha adrenergic blockade for bladder neck impedition and oral striated muscle relaxant (baclofen) for the pubo sphincteric involvement. It is however suggested that in some cases this local hypertonicity and dyssynergy may be secondary to pelvic instability and that successful treatment of the primary lesion improves the measurable urinary flow.

Treatment is directed at reducing local inflammation and pain consequent upon this to allow physiotherapy in order to stabilize the pelvis. The local acute inflammation was reduced by an oral non steroidal anti inflammatory agent such as phenylbutazone 200 mg t.i.d.s for one month followed by 100 mg t.i.d.s for a second month. Local ultrasonic therapy increases the local microcirculation and consequently reduces local pain and local hypertonia. It was given in exposures of less than 1 watt in order to allow progressive pelvic floor exercises without creating cavitation or aggravating osteo-necrosis.

Pelvic floor dyssynergy may then be overcome, and the pelvic girdle consequently stabilised by the enthusiastic exercise of the muscles of the pelvic floor together with the other subtending groups such as the long adductors of the thigh the pectineal muscles and the abdominal recti (Fig 6).

Fig 6 Treatment

In the 35 cases of this series significant symptomatic improvement was achieved in 34 (97%) and 22 (63%) became symptom-free and were able to return to full physical activity. Two patients suffered symptomatic relapse but both subsequently improved with repeat treatment. Only one patient required a surgical arthrodesis. Following treatment, repeat scintigraphic bone study demonstrated a reduction in activity at the symphysis. The radiological changes although showing no progression do not return to normal. It is concluded that osteitis pubis can frequently mimic prostatic pain and also be responsible for a reduced urinary flow rate.

The diagnosis is confirmed by simple non-invasive methods and rational non-surgical treatment results in a significant resolution of the symptoms.

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Dermatofibrosarcoma protuberans: an unusual tumour

D N Tulloch and R J Leicester

INTRODUCTION

Dermatofibrosarcoma protuberans (DFSP) is a distinctive cutaneous fibrous tumour that has a high recurrence rate following excision. It is a relatively rare tumour but with clinical awareness of the diagnosis, accurate histological confirmation and aggressive treatment good results following wide excision may be obtained. We report a case outlining the clinical and histological features.

CASE REPORT

A 67 year old male presented to his general practitioner with an ulcerated polypoid lesion on his anterior abdominal wall. A small cutaneous nodule at this site had first been noticed by the patient some eight years previously which over a three month period had markedly enlarged and ulcerated through the skin. He sought attention only when the lesion started to bleed on contact with his clothing. Past medical history was otherwise unremarkable.

Examination revealed a thin but well looking man with no abnormalities on his major systems.

On his anterior abdominal wall inferior and to the right of the umbilicus there was an 8 cm diameter firm polypoid lesion which was superficially ulcerated and exhibited contact bleeding (*Fig.* 1). The lesion was surrounded by multiple shiny subcutaneous nodules which extended for approximately 7 cm from the main pedicle. The remainder of the skin was normal. Enlarged lymph nodes were present in the right inguinal region.

Investigations revealed a raised ESR (26 mm/hr) normal full blood count blood urea serum electrolytes and liver function tests. Radiography of the chest showed signs of longstanding chronic obstructive airways disease.

A clinical diagnosis of fibrosarcoma or liposarcoma was made and the polypoid part of the lesion was excised. Histological examination revealed a storiform appearance of densely packed spindle cells typical of DFSP (*Fig.* 2).

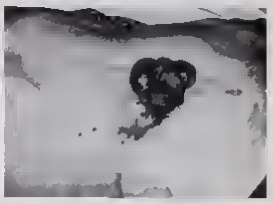

Fig. 1. The tumour at presentation exhibiting ulceration of its polypoid portion.

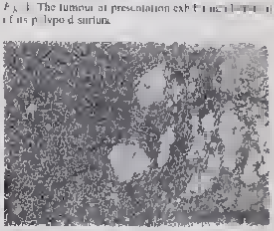

Fig. 2. Histological section showing typical storiform arrangement of the closely packed spindle cells. (H & E × 150.)

Wide excision of the tumour area was performed including a margin of 5 cm of normal skin to the depth of the epimysium of the abdominal musculature (*Fig. 3*). The resultant defect was primarily grafted with split skin from both thighs. In order to minimise the size of the donor sites in a thin man, the grafts were meshed on a 3:1 Zimmer Dermacarrier. Excision biopsy of the right inguinal lymph nodes was also performed. Histological examination of the excised lesion showed that tumour extended into subcutaneous tissue but did not infiltrate the deep fascia. The lesion was completely excised with a 5 cm margin of normal skin. The tumour cells again showed the storiform arrangement of spindle cells and although there was little nuclear pleomorphism there were frequent mitoses. Histology of the excised lymph nodes showed reactive hyperplasia only. The patient was discharged on the 12th postoperative day and at review three months later showed complete healing of the grafted area (*Fig. 4*) and donor sites. There was no evidence of recurrent tumour.

Fig. 3. The extent of the excised area prior to grafting.

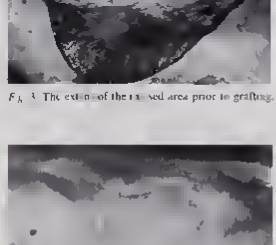

Fig. 4. Grafted area at review three months after operation.

DISCUSSION

Dermatofibrosarcoma protuberans is an uncommon tumour which tends to present on the trunk and proximal aspects of the limbs; distal tumours being uncommon. A typical history is that of a longstanding lesion which had changed little over several years suddenly enlarging. This accelerated rate of growth is often attributed by the patient to an episode of trauma but a direct correlation has not been established [1].

Clinical appearance of the tumour varies greatly ranging from a small mobile plaque underlying the skin to a large polypoid ulcerating lesion with horizontal invasion as illustrated in this case.

Histological examination shows it to be of histiocytic origin with no evidence for the once held theory of it being derived from Schwann cells [2]. The storiform appearance of the closely packed spindle cells is claimed by some to be pathognomonic [1]. It has been reported previously that nuclear pleomorphism is uncommon but in contrast to our findings the earlier reports have stated that the presence of mitoses is rare [1-3]. Metastasis to regional lymph nodes is very rare [1-3-4] and it is suggested that metastasis only occurs in tumours that have been repeatedly manipulated following inadequate primary excision [1-4].

There is a consensus of opinion that radical excision of the lesion with a surrounding margin of at least 3 cm of microscopically normal skin is mandatory. There have been no reports of the benefits of adjuvant radiotherapy but the personal experience of some authors seems to imply that there is no place for this type of treatment [1-3-4]. Recurrence rates of up to 50% are quoted in most series [1-3-4] due it is thought, to inadequate primary excision. Long term follow up is therefore essential to detect and treat such recurrence.

SUMMARY

Dermatofibrosarcoma protuberans is a rare tumour which is unlikely to metastasise. Radical excision is necessary in order to prevent recurrence. The above case outlines the typical presentation and illustrates the steps in management.

Acknowledgements

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Functional imaging in nuclear medicine—mathematical and physical aspects

A. S Houston

Summary

Functional imaging has recently played a most important rôle in diagnosis in nuclear medicine. In this paper the mathematical concept is described and a variety of applications discussed.

INTRODUCTION

In nuclear medicine a dynamic study is stored on the computer* as a sequence of images each representing a known time interval post injection. Each image (or frame) is stored as an m × n (m by n) array of picture elements (or pixels) each containing an integral value representing the number of counts collected in that region over that time interval. Usually the array is square i.e. m = n.

If we consider the same pixel on each frame we can obtain a plot of counts against time for that pixel. For any study there will therefore be m × n such plots (or dixels).

Let us suppose that we can find some numerical value (or parameter) for each dixel, representing some property of the set of dixels. An image may then be formed by displaying the m × n array of parameter values. This is known as a functional (or parametric) image and represents the distribution of the parameter across the field of view.

Let us consider a simple example using three frames collected as 3 × 3 arrays. Suppose that the counts in each pixel are as follows:

1st frame	2nd frame	3rd frame
7 5 5	6 8 7	5 7 8
8 4 7	5 6 8	6 5 9
6 4 4	5 7 5	5 4 7

The dixel corresponding to the upper right hand pixel consists of the values (5 7 8). If we now define our parameter to be the frame corresponding to the maximum value (time-of-maximum) this will have a value of 3 since the third frame has the highest pixel count. The functional image of time of maximum will be

1 2 3
1 2 3
1 2 3

This shows that dixels on the left of the image peak earlier than those on the right. This may be viewed for example by displaying 3 as white, 2 as grey and 1 as black.

TECHNIQUES

For a given study one or more parameters may be imaged. The variety of parameters in routine use is quite diverse and ranges from simple parameters such as time-of-maximum to complex parameters such as the coefficients of a principal components analysis.[2]

The aim of the exercise is to separate regions of different physiological function in the image (this being the reason that clinicians use the term functional image). Hence, in a DTPA kidney study the time of maximum image will distinguish areas of normal and abnormal uptake and excretion as well as differentiating between blood background, kidney and bladder. Other simple parameters in common use include various gradient (slope) time and count difference parameters.

A second class of parameter may be derived from fitting to each dixel a curve representation of a mathematical function (this being the reason that physicists use the term functional image). This function is usually based on an understanding of

Excellent review articles on the use of computers in nuclear medicine may be found elsewhere.[1,2]

the physiological [illegible] computational model but occasionally may be empirical For example, we may know that a pixel d(t), should take the form

$$d(t) = A(1 - \exp(-\lambda t)) \quad (1)$$

where t is time and A and λ are parameters which may be imaged In this case A is an asymptotic value while λ is an exponential rate constant

More complicated examples of this class include single-harmonic Fourier analysis the appropriate defining function being

$$d(t) = C + R \sin(\omega t + \phi) \quad (2)$$

where ω is a constant ensuring that ωt runs from 0 to 2π and C R and φ are parameters to be imaged The parameter C is a mean value and is not very useful However R (amplitude) and φ (phase) are often useful particularly when the technique is applied to cardiac studies

Perhaps the most advanced application of functional imaging in use is when principal components analysis is applied to the pixels [3] Factorial images as they are known display coefficient distributions for each principal component Since principal components analysis is the optimal linear method of obtaining an overall fit to a set of pixels using a given number of parameters factorial images almost invariably contain more information than conventional functional images However they are often difficult to interpret and recent research in this field has involved increasing the physiological relevance of factorial imaging [4, 5]

APPLICATIONS

Functional imaging was first used to display regional rate constants as long ago as 1969 [7] Since then the range of applications has become so diverse that an entire international conference was devoted to the technique in 1981 (Society for Nuclear Medicine (Europe) Berne 1981) It would clearly be impossible to cover the full range adequately in the space available Instead, the use of the technique in our department will be described as our own applications are sufficiently diverse and typical of the overall range

Renal function studies are performed in the department using ^{99m}Tc DTPA Fifty frames of 20 seconds each are collected post injection and stored in a 64 × 64 array Two functional images are formed (1) the time of maximum image described earlier (2) an image of the difference between the maximum and final values These are displayed for a normal patient in *Fig* 1 The clinical interpretation of these and other images will be described elsewhere [6]

Fig 1 [illegible] maximum count [illegible] Kidneys Black corresponds to a [illegible] and a large full value. Note that the bladder has maximum later than the kidneys which must display greater full values

Bone uptake studies are performed using ^{99m}Tc MDP Twenty frames of one minute duration are collected post injection and stored in a 64 × 64 array The uptake in bone may be approximated by equation (1) of the last section However the statistics in a single pixel are insufficient for accurate assessment of A and λ. In order to overcome this problem the image is first reduced to a 16 × 16 matrix by summing 4 × 4 array blocks across the image Functional images of A and λ are then generated and displayed Examples for a normal patient are displayed in *Fig* 2

Equilibrium cardiac studies are performed using an ECG gate The R wave of the ECG triggers the

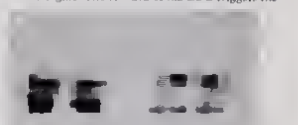

Fig 2. Asymptotic (top left) and exponential rate images for normal knee. Black corresponds to a high value in each case

computer which collects 16 frames across the heart cycle Since we require that these frames cover the entire cycle the frame time length is first calculated as one sixteenth of the cycle time which of course is inversely related to the pulse rate. In this way we can superimpose cycles until adequate statistics (5 10 million counts) are attained. The frames are stored in a 32 × 32 matrix which is zoomed to one-quarter of the available field of view Phase and amplitude images are obtained using a single-harmonic Fourier analysis (equation

...) Normal examples are shown in *Fig. 3*. It is however possible to obtain phase like and amplitude like images using a simple transformation of the first two factorial images and this technique is being researched at present. Examples of these images are displayed in *Fig. 4*.

Fig. 3. Amplitude (on left) and phase [illegible] functional heart viewed in the anterior position. Dark left black corresponds to a large amplitude, while on the right everything in phase with the left ventricle appears as dark grey and everything out of phase with the left ventricle as light grey.

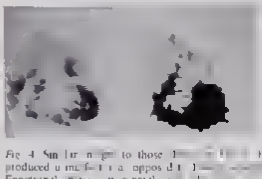

Fig. 4. Similar images to those [illegible] produced using the opposite [illegible]. Functional images in general [illegible] particular are best viewed in colour.

CONCLUSION

The concept of functional imaging is a simple one. It is of great clinical importance in nuclear medicine and has begun to pervade other modalities such as digital radiography. Currently it is regarded as an established practice in most nuclear medicine departments and in our case has played a most important role in diagnosis for the past three years.

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Functional imaging in nuclear medicine—clinical aspects

M A Macleod

Summary

The application of functional or parametric imaging to the solution of various clinical problems is discussed in general and in particular to studies of the heart kidneys and bone

INTRODUCTION

Nuclear medicine can be described as the link between a particular clinical problem and the attempt to solve it by using a particular test employing radionuclides Any useful information gained is usually passed to the ward doctors in a variety of easily recognised conventional forms ng static images of count rate distribution dynamic studies of how this count rate varies with time uptake and loss data and volumes of distribution In many cases however the results of conventional dynamic studies often do not answer the particular clinical problem posed and this has led in turn to the development of functional imaging

As explained in the preceding paper[1] parametric or functional imaging has been used over the past decade or so in an attempt to display visually appropriate regional rate constants derived from conventionally obtained images e.g. from gamma camera computer assisted dynamic studies To apply functional imaging to a particular clinical problem successfully we must first identify the pathophysiological functions involved and then ascertain if these can be measured using an appropriate mathematical function For example the uptake of bone scanning agent in bone takes the form $d(t) = A(1 - e^{-\lambda t})$ and this equation contains two constants A and λ which may be used to describe two physiological parameters encountered during the uptake of ^{99m}Tc MDP in bone These are the total number of counts in any given area A equivalent to the number of active osteoblasts and λ the accretion rate of the radionuclide in the same area equivalent to the viability of the microvasculature which brings the substance there There are of course many other forms of mathematical functions which can be applied with equal success to various physiological functions but in the main it usually becomes evident that for each clinical problem there will be one functional image that is more appropriate than another

FUNCTIONAL IMAGING IN NUCLEAR CARDIOLOGY

Functional imaging techniques can be applied to both first pass and gated cardiac studies Fourier phase/amplitude imaging has been applied successfully to each method by several workers[1] The disadvantage of this method, however in the assumption of perfect symmetry throughout the cycle, has led to the introduction of factorial phase imaging which includes the effect of asymmetries

First pass studies

In this technique the patient is usually placed supine in the right anterior oblique position and a bolus of 8mCi $^{99m}TcO_4^-$ injected rapidly into a vein Data are acquired for 50 seconds at 20 frames per second and corrected for uniformity and dead time Following this serial frames are summed for each study over approximately 1 second intervals and an image corresponding to the LV phase identified A region of interest is then drawn round the left ventricle and an activity time curve generated

A representative cycle of each study is created by summing corresponding frames of several

cycles and mid diastole and end systole identified as the respective peaks and troughs in the cycle.

Once a representative cycle is established parametric imaging is applied to the analysis of the cycle producing factorial amplitude and phase images. From the data various clinical parameters and observations can be deduced. These include estimations of the left ventricular ejection fraction, wall motion defects eg. hypokinesis and aneurysm and filling and emptying defects eg. shunts and valvular incompetence.

Gated cardiac studies

Gated cardiac studies are more commonly used than first pass studies in nuclear cardiology. The initial preparation and injection of $^{99m}TcO_4$ is exactly the same as for first-pass studies but the collection of data is different. In gated cardiac studies a (Rigel) cardiac monitor (essentially a simplified ECG machine) is used to trigger collection of data at end diastole (R wave) and end systole (down stroke of the T wave) ensuring a continuous collection of data equating with the cardiac cycle.

Using parametric imaging in a similar manner as with first pass studies to analyse the data contained in the cycle it is possible to measure local variations in the left ventricular ejection fraction and make observations on wall kinesis and emptying filling defects. Examples of abnormal parametric images are shown in *Figs* 1 and 2. These should be compared with the normal images shown in the preceding paper.[1]

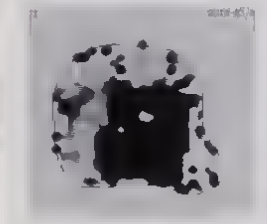

Fig. 1. An example of an [illegible] indicated by the arrow which is 180° out of [illegible] at the ventricle.

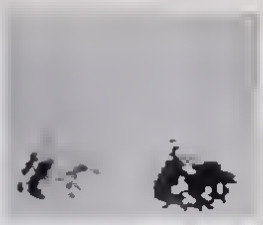

Fig. 2. An example of [illegible] myocardial infarction. [illegible] regions throughout the left ventricle which [illegible] phase with neighbouring areas of muscle.

FUNCTIONAL IMAGING IN NEPHROLOGY

Functional imaging techniques can be used routinely in renal studies by applying factor analysis to the time activity curve or renogram obtained during renal dynamic scintigraphy. Out of the numerous parameters obtained from the renogram curve shape the two used in the Royal Naval Hospital Haslar to generate functional images are (i) the time to maximum TMAX or ymax and (ii) the amount of decrease FALL or ymax-yt. The TMAX image shows relative times of passage of tracer through the kidney parenchyma and urinary tract and can thus differentiate between the normal and kidneys with parenchymal damage and obstruction. The FALL image shows the relative stages of clearance of the tracer from the urinary tract thus giving further information about the extent of any obstruction present (*Figs* 3 and 4).

FUNCTIONAL IMAGING IN SKELETAL STUDIES

Parametric imaging can be used in skeletal studies to measure bone marrow circulation and osteoblastic activity. Following the injection of 15mCi ^{99m}Tc methylene diphosphonate data are collected over the appropriate region of interest (bone lesion) as 20×1 minute frames on a 64×64 matrix. Functional images of both amplitude (osteoblastic activity) and detection rate (local

Fig. 3 Pa[illegible] showing left kidney w[illegible] enlargement of the right. The Tmax image on the left shows normal passage of chelate through the parenchyma except in the lower pole which has a prolonged transit time. The FALL image on the right shows some retention of activity in the PUJ which corresponds to a delayed clearance seen on the urogram

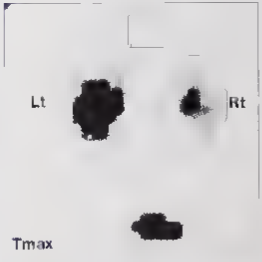

Fig. 4 Parametric images [illegible] the left kidney. The [illegible] quantity. In the parenchyma [illegible] transit times [illegible] FALL image shows [illegible] parenchyma

micro-circulation) constants are generated for a reduced matrix of size 16×16 and the areas involving the lesions are examined for both the extent of osteoblastic activity and viability of local micro circulation.

McEwan *et al*[3] used this technique in a study of the pathological knee and were able to show that the qualitative hot spots seen in the affected knee could be due to one or both parameters. Thus although the bone scintigrams indicate pathology the treatment may be entirely different depending on whether the local micro-circulation is enhanced normal or absent (*Fig. 5*).

Obviously if we apply this concept to the study of scintigraphic lesions obtained following dysbarism steroid therapy or alcohol abuse it should be possible to detect those lesions in which the accretion rate constant image (local micro circulation) is altered. Assuming that the definition of osteonecrosis i.e. necrosis of bone tissue following ischaemia is correct then it should also be possible to demonstrate those lesions in which circulation is diminished or absent and thus predict the onset of osteonecrosis[4] (*Figs 6 and 7*).

In conclusion it can be seen that functional imaging is an important adjunct to diagnostic imaging both in the qualitative and quantitative

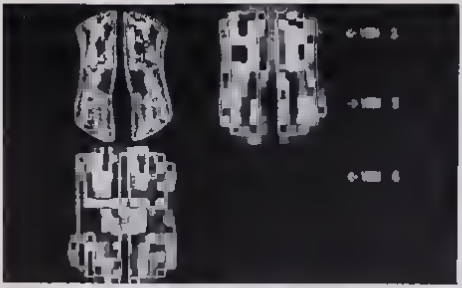

Fig. 5. A normal scintigraphic image of both kidneys with normal amplitude (view 5) and accumulation (view 6) parametric images

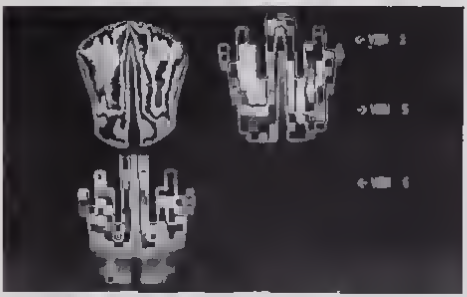

Fig. 6. An abnormal kidney and the left lower pole of the left kidney in the amplitude parametric image (view 5) and the uptake rate parametric image (view 6)

Fig [illegible] the head right humeri [illegible] with an increased amplitude [illegible] (view 5) and absent activity in the image (view 6)

sense. Its use has resulted in better cardiac images and measurement and it is the only method in use at present which can successfully predict avascular necrosis of bone.

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Pilgrimage to the Falkland Islands 1983

C W Millar

The Falklands Pilgrimage took place in the first half of April 1983 the members of the party meeting at the Cunard International Hotel in London on the afternoon of Monday 4 April and dispersing at London Airport Heathrow on Sunday morning, 17 April The group consisted of approximately 550 bereaved relatives and friends and 60 escorts It was considered necessary to include medical support in the escort party Superintending Nursing Officer Clements and I being selected This was an honour which carried with it some responsibility and considerable anxiety!

After dinner on the Monday evening, we were briefed and the following morning the coaches took the party to Heathrow where the passengers were put on two flights the first a Boeing 747 and the second a Tri star these being separated by about two hours The journey was in two legs the first to Barbados lasting approximately eight hours where there was an hour s stop-over and the second of seven hours duration to Monte video I flew in the first aircraft with Sue Clements in the second there being by coincidence a general practitioner amongst the passengers on her flight The *Cunard Countess* leased by the Ministry of Defence was the vessel used for the final stage of the voyage to the Falklands

The bereaved came from all walks of life and ranged in age from babies to pensioners These were not a self-selected group of travellers they were not subject to physical or mental screening and they had to travel on a specific date. Very limited forewarning of possible problems was given to the medical escorts but it was known that the group included people suffering from angina epilepsy and diabetes The most recent heart attack had been two months prior to the flight one diabetic had been taken off insulin two weeks beforehand a female had been plated six weeks previously and the usual treatment offered to the epileptic when in status epilepticus was rectal valium I had visions of using this technique and medication in the aisle of the aircraft! I did not have foreknowledge in which aircraft these potential patients were flying, so that the modest quantity of drugs carried were divided between the medical escorts in the two aircraft The pilgrims for the most part did not know each other and had neither flown nor been to sea before These factors increased the natural anxiety felt by most embarking on this unique journey

The escort party was led by Colonel S Love MBE who had been Military Attache in Buenos Aires at the time of the conflict and his second in command was Commander R J Sandford RN the Commander of HMS *Antrim* during the battle The remainder consisted of Service and civilian families welfare officers many of whom had been concerned with the families since their bereavement British Red Cross and Red Cross and St John s personnel some of whom provided a crèche for the young children together with representatives from such organisations as SSAFA Commonwealth War graves Commissions Ministry of Defence (DS 14) Combined Service Entertainment and Interflora

Few problems were encountered in the first leg of the journey by air the two notable exceptions being the lady with abdominal cramps and distension due to Cunard s over generosity with baked beans for breakfast in the hotel and a boy with a profuse anal discharge The second leg in the 747 produced one severe asthmatic attack one chronic bronchitic who developed respiratory embarrassment due to bronchospasm numerous minor complaints usually of an upper respiratory nature and some over indulgence in alcohol the bar having been open for approximately 16 hours! Sue Clements on the Tri star had to deal with a

severe migraine brought on by environmental factors

We were kept in bond whilst in Montevideo which necessitated one literally walking off the aircraft steps into waiting coaches erotically timed and surrounded by an armed Uruguayan guard. As one coach filled it moved off to a parking area awaiting there until the last coach was ready the convoy then moving off under a police motorcycle escort. The coach journey took place at night, but on the return trip in the early morning pedestrians indicated their understanding and friendliness by waving at the passengers in the coaches

I waited in the reception area on the *Cunard Countess* for the passengers from the second aircraft to embark and ascertained that there was only one medical problem that of the older lady with a severe migraine allied to anxiety this condition took two days to respond to treatment. The 11 year old with the recently plated femur was considerably more comfortable in his bunk than he had been on the aircraft the major problem was that he had fallen off an x ray table one week before flying and the plate was not immobilising his fracture By 0600 BST all passengers were aboard an hour later it was considered that all medical conditions had been taken care of and the clock was turned back to 0400 (local time)

To our surprise included in the passenger list were three Uruguayan children en route to join their mother who after divorce had married a Falkland Islander These unfortunate Spanish speaking children were bewildered and anxious and suffered terribly from sea sickness Sue did a great deal to allay their anxiety and comfort them

The Cunard staff included one Medical Officer one Nursing Officer and a Medical Assistant Petty Officer The hospital consisted of waiting treatment and consulting rooms an operating theatre and two wards of three beds each There were morning and late afternoon surgeries and under normal circumstances there would have been much visiting in cabins—this did occur on the first day at sea when there was a high incidence of sea sickness The Sick Bay was run by the Cunard staff with Sue and I assisting as necessary acting as locums and answering the Tannoy as required Our major contribution as expected was assisting the bereaved with their grief reactions and problems

Three days were spent on the journey south the first day in relatively calm seas producing an inordinate amount of *mal de mer* This was undoubtedly due to tiredness the alien environment having been told by well wishing friends to expect sea sickness and anxiety as to what lay ahead A high proportion of the treatment administered was in the form of injections of Phenergan or Maxolon Stugeron was given orally to early sufferers The mood was generally calm and quiet with apprehension about the immediate future and how the individual would react at the time of maximum stress Morale was always boosted by the entertainment provided by the CSE performers on board the task of these individuals was difficult for they also had to gauge the mood of the audience attempting to bring them out There is no doubt that the artists did an excellent job

Our first contact with the garrison was the arrival of a helicopter bringing liaison officers on Saturday 9 April Later that morning the misty outline of Pebble Island could just be seen off the starboard bow but as we closed Falkland Sound the haze started to clear and we were blessed with fine days during our stay The landscape almost treeless was impressive reminiscent of some parts of Western Scotland all was peaceful

The turning point for morale was after the three services at sea held on that Saturday Until this time the pilgrimage had been undertaken by individual or family units but by the evening of that day the pilgrims had become one large family, despite the fact that only a few Naval families had been involved It was also about this time that someone appeared wearing a sweater bearing the crest of a lost ship these sweaters suddenly became relatively commonplace indicating an intense pride despite the bereavement

The dedication of the memorial and cemetery at San Carlos took place the following day This was a most moving service the address being given by the Bishop to the Forces The wreaths and fresh flowers were outstandingly beautiful contrasting with the dark grey slate of the memorial tablets set in the recently built stone wall

In the afternoon Sue and I took the opportunity to visit the Red and Green Life Machine at Ajax Bay This currently served as accommodation for an RAF radar section with the radar perched on the top of the ridge behind Ajax Bay

On Monday 11 April the service was held for All those who had no grave but the sea followed by the sail past of HM Ships *Cardiff* and *Active* which acted as escorts to the *Cunard Countess* In the evening the service was held for those lost in HMS *Sheffield* The ceremony was very quiet and those directly involved were joined by other bereaved families for support. The service for *Sir Galahad* was very emotional with the families spontaneously breaking into song as only the

Welsh can really do once the floral tributes had been laid on the sea

The services for those lost at sea were short and on the whole only those whose loved-ones had been lost were present together with all the Naval escort party and where appropriate the Army escorts Those involved in the service gathered in the lee of the flight deck the families moving forward to the guard rail for the laying of the wreaths coming back to join the escort when ready When necessary members of the escort party would move forward to help those in need in this way the grief reaction was sublimated

On Tuesday 12 April the *Countess* anchored off Port Stanley and the vast majority of families went ashore Many were driven or flown to places of particular interest to the individual and entertained to lunch by the local populace in their own homes The weather throughout the four days in Falkland waters was superb the islands looked beautiful and the inhabitants were friendly and grateful The combination of these factors did a great deal to achieve the aims of the pilgrimage

The return voyage and flight were considerably more relaxed than the travels outward bound but as is so often found in rather unusual circumstances leadership played its part Colonel Love led from the front his escort party following his example on the dance floor at the discotheque and bending the rules on the shuffle board! However on the penultimate day the pilgrims were starting to oust the Colonel and the escorts from the dance floor and the shuffle-board thus leaving more room at the bar!

The usual conditions seen in general medical practice ashore were encountered The only psychiatric case was a member of the ship's staff whom became psychotic possibly due to alcohol or its withdrawal One 40 year old passenger developed femoral vein thrombosis was anticoagulated and put ashore in Port Stanley

On the return journey three hours before he was due to disembark to fly home a young man in his late teens was diagnosed as suffering from acute pericarditis and was put ashore to the British Hospital in Montevideo Having been assessed and given medication he was flown home in the second aircraft in the care of Sue Clements

I administered one 10 mg capsule of Librium on the return flight to a young widow this being my total pharmaceutical anxiolytic and anti-depressive contribution throughout the whole trip The Cunard Medical Officer issued a mere handful of tranquilisers From the outset I believed that the grief reaction had to be worked out by the individual on the voyage, that counselling was all important if requested or seen to be needed and that delay in reaction through the use of drugs would be counter productive In the event, this policy appears to have been entirely successful

I believe as do the other members of the escort party that the pilgrimage was a success but there is no firm yard stick by which this can be measured The link of ill health and complaint on the return voyage and flights compared with that on the outward journey indicated that misgiving and tension had been eased and generally there was greater peace of mind amongst the travellers This was a most emotionally draining but unique and memorable experience I feel greatly honoured to have been selected to accompany the pilgrims

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Medical Services at Chatham Dockyard 1625–1984

R de G Hansdn

INTRODUCTION

The closure of Chatham Dockyard at the end of March 1984 terminates 437 years of naval shipbuilding and ship repair on the River Medway The same closure also marks the demise of a medical service which has provided care for the work force for 359 of those years

16TH AND 17TH CENTURIES

Occupational health has been practised at Chatham Dockyard from its earliest times In 1590 Sir Francis Drake and Sir John Hawkins instituted the Hawkins Hospital a hostel for 12 pensioned seamen and the Chatham Chest a pension fund for disabled sailors funded by regular deductions from seamen s pay The first medical officer of the yard was a local barber surgeon called John Pawson who was appointed in 1625 by warrant from the Lord Admiral Having appointed a doctor the next step was to give him somewhere to work and about 1711 the first proper surgery was established It seems likely that by the middle of the 18th century the Surgeon may have been required to carry out some form of entry medical as a standing order of that time states No old lame infirm unqualified men were to be entered There had been pressure for the building of a naval hospital at Chatham since 1666 but not until 1757 was a site found for it. Whether it was used for injured men from the Dockyard is uncertain but it was probably this infirmary which was converted into the Melville Hospital of 1827 and this was certainly used by Dockyard men until the Royal Naval Hospital was opened in 1905

18TH AND 19TH CENTURIES

An examination into the affairs of the Dockyard in 1787 appears to have heralded a tightening up of the medical organisation in general and an order of 1801 gave definite instructions for the examination of new entries It also stated that unless men who were hurt reported to the Surgeon and had their names entered on the Hurt List they would have no claim for compensation that the Surgeon was to supply trusses to those receiving hernias during the performance of their duties and that he was to keep a sick list No apprentices were to be entered but such as are stout well grown boys not under the age of fourteen years or of less height than four feet ten inches tall This instruction must be seen against the exploitation of child labour in mines mills etc at the time and the Admiralty was well ahead of its time in the limits it proposed Another sensible instruction was that no one over the age of thirty-five is to be entered as a rigger or a rigger s labourer The work of a rigger was particularly arduous and dangerous Working hours were from 6 a m to 6 p m (light permitting) with ½ hours for midday dinner in the summer and 1 hour in the winter Sick absences required certificates and a careful distinction was made between the wounded or hurt and the sick the former being compensated and the latter being regarded as unfortunate but not compensatable The concept of industrial diseases was still some way off

The date on which Royal Naval medical officers began to look after Dockyard employees is uncertain Until 1805 the Surgeons were definitely civilians but from about this time they were regarded as naval officers Whether they wore uniform in the dockyard is not known but naval surgeons were uniform from this date and the dockyard medical officer of the time appears in the Navy List

At the start of the Industrial Revolution

machinery began to be installed in the yard Sir Marc Brunel father of Isambard Kingdom Brunel built the sawmills in 1810 13 and the main smithery was erected in 1836 With the increase in the work force to 3000 in 1839 the dockyard medical facilities were being stretched to cope not only with sick and injured personnel but with the 1500 new entry medicals that occurred that year One industrial accident which appears in the reports of that period was caused by the adze a tool rather like an axe-head turned through 90 which was used for trimming wood and which could cause severe foot injuries

Wood was on the way out however and in June 1862 a riveter received severe injuries while working on HMS *Achilles* the first iron ship to be built at Chatham and the first time the word rivets was used By 1864 the change-over to building with metal was producing its own medical problems among employees who now numbered 4000 By the use of new tools the men are subject to injuries of the palms of the hands causing inflammation ending often in deep seated abscesses. Deafness was also met with owing to the incessant noise attending the new kind of work this is most remarkable amongst the boiler makers

From 1865 onwards some form of ambulance was available The spring carriage used by us for the conveyance of the Hurt and Sick was manufactured in this yard in 1865 at a cost of £7 5s 0d Some thought was given to those who were injured in work and at this time employees put on the Hurt List received half pay for six months and were usually then invalided with a gratuity Although the Dockyard's treatment of those injured at work was for the times compassionate there was little interest in preventive medicine Safety Officers were unheard of and the effort of the medical department was aimed at treatment rather than preventive medicine

Of course the doctor must have had some assistance but unfortunately there is little mention of staff employed in the medical centre at this time Nursing was in its infancy but there is a record of a surgery messenger probably the equivalent of a surgery assistant who was paid 3s 6d a day or £63 17s 0d per annum and who on retirement after 47 years service received a pension of £42 11s 0d per annum (two-thirds of his salary) In 1866 women were employed in the yard owing to a shortage of labour and have been employed there ever since

20TH CENTURY

The turn of the century saw the consolidation and organisation of the medical services but unfortunately few pre 1914 records remain This is rather a pity since the formation of an Electrical Engineering Department in 1903 must have brought new medical problems into the Dockyard During the Second World War 13000 people, including 2000 women were employed in the yard 1360 ships were repaired and ten submarines one cruiser and six other vessels built Fifteen people were killed and 107 wounded during bombing raids

The Royal Naval Hospital Chatham had been opened in 1905 by King Edward VII and provided back up facilities during this period and continued to do so until it was transferred to the Ministry of Health on 15 January 1961 Since that time the hospital has provided a much-needed accident service and continues to care for sick dockyard employees

In 1962 a new medical centre was opened and reorganisation of the records system undertaken Submarine production was discontinued in the 1960s but the 1970s saw the development of the nuclear refitting programme which added a new dimension to occupational medical care in the dockyard By June 1981 when the proposed closure was announced the surveillance of radiation workers formed a large proportion of the routine medical examinations During normal working hours the medical centre was manned by two naval medical officers three full-time and two part time nurses and five surgery assistants together with clerical staff At other times the medical centre was manned whenever there were more than 150 people in the yard and a naval medical officer was always on call for emergencies

In the spring of 1983 HMS *Churchill* the last submarine to be refitted at Chatham left and the number of workers in the dockyard became noticeably less This decline became even more noticeable at the end of June with the departure of HMS *Hermione* and the end of prodnetive work

The last full time naval medical officer left the dockyard on 29 July 1983 leaving behind a reduced nursing staff and a civilian medical practitioner to care for the small residual workforce The medical centre itself closed at the end of February 1984 and for the final phase first aid was given from an ambulance room

EPILOGUE

Industrial medicine has come a long way since 1625 especially in the last 100 years but there is still far to go and it is with regret that one sees

what is probably the oldest occupational health service in the world coming to an end

We all look forward to a world in which there are no absences due to injury or industrial illness and perhaps one day this will come to pass *Ars longa vita brevis*

Acknowledgement

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Memorabilia

Surgeon Vice Admiral Sir Cyril May, KBE, CB, MC, FRCS, Royal Garrison Artillery and Naval Medical Officer, 1897–1979*

F P Ellis

Few would associate the young Army officer in the photograph below with the rather more robust naval officer whom many of us knew as Medical Director General in the mid fifties. In 1918 Major R C May was the youngest major in the British Army and is pictured here with his father Mr Robert May at Buckingham Palace where he was decorated with the Military Cross by His Majesty King George V.

Sir Cyril diffidently showed me this photograph when I lunched with him only eight days before his sudden death on 17 September 1979 from a ruptured aortic aneurysm. He also produced a Supplementary Volume to The Record of Old Westminsters compiled by F E Pagan (1978 Vol 3) of those who went to the school between the Play Terms of 1893 and 1960. Four of the photographed were in the Services. He was the only Naval officer, the other three were Army. Two awarded the Victoria Cross and one a Lieutenant General.

He joined the Royal Garrison Artillery straight from Westminster in 1915 and served until 1920 when he went to Guy's Hospital. He married Mary Robertson in 1935 and, when qualified, applied to join the Royal Army Medical Corps but was told they did not take married officers, so he joined the Navy.

The Mays were a happy couple who loved to entertain—he was an excellent cook. They also liked to travel and after retirement spent four weeks visiting my wife and myself in Washington DC and also the battlefield of the War of Independence at York Town, Williamsburg, the first capital and the early colony at Jamestown in Virginia. On another occasion when we were

* An appreciation was published at the time of Admiral May's Death (*JRNMS* 1980(1) 81) but this recent contribution completes the picture of a remarkable man who, having served with great distinction in the Army, went on to become Medical Director General of the Royal Navy.

driving back from a holiday at Menton he had his first brief sight of the battlefields since the Armistice—the only time I ever heard him mention the First World War We stopped at a sleepy little village in the so very flat Flanders fields on a very hot day and his eyes lit up

I remember this place The French and Americans got into an awful mess My CO said "May take your battery and pop down and fix things up So we popped down fixed things up and popped back again

In his obituary notice Admiral Gurd referred to Sir Cyril having been immured in the Medical Department from December 1938 until early 1947 One reason for his retention by successive Directors, after having served with great distinction at the Royal Naval Hospital Hong Kong from 1934–37 as surgical specialist (with Surgeon Captain R A Graff as medical specialist) was because he was MDG's man on the Air Ministry's Flying Personnel Research Committee (FPRC) from its inception in 1938 whilst Graff together with MDG himself Surgeon Vice Admiral Sir Sheldon Dudley represented the Department on the Medical Research Council's Royal Naval Personnel Research Committee (RNPRC) after it was formed in 1942 Sir Edward Mellanby Secretary of the MRC was Chairman as he was also of the FPRC These four coordinated the Royal Navy's medical research interests not only in general medicine and surgery and later personnel research but also in research into the medical aspects of chemical and, towards the end of the war biological warfare which was then being conducted in the utmost secrecy

As Admiral Gurd stressed he was outstanding as Director kind and understanding but a tremendously hard worker who did not tolerate stupidity or laziness During his term of office the Annual Reports on the Health of the Navy which after 100 years had been discontinued just before the outbreak of World War II were reinstituted personnel research flourished and long after the war had ended he obtained Treasury sanction for the Admiralty to refund to the MRC the money it had expended on research for the Navy This ensured the subsequent initial success of the RNPRC's new Submarine Sub-committee in dealing with the complex problems of prolonged continuous submergence for months on end in a totally enclosed space in very close proximity to a powerful nuclear reactor When nuclear weapons came on the scene he obtained the consent of the Board of Admiralty for a British aircraft carrier to participate in the next nuclear weapon trial to test protection against possible fall-out in the Pacific following the Christmas Island detonation in the event, this did not take place

I soon learnt never to take a problem to him He only wanted answers However on one occasion when he knew I had a lot on my plate he wrote a 1½ page minute on an important paper and asked me if I thought it would do

Sir Cyril was an excellent judge of men and personally selected for three years training the first medical officer (Surgeon Lieutenant R J W Lambert) for the first British nuclear powered submarine HMS *Dreadnought* He took an active interest in developing the training courses for medical officers and sick berth staff so that when Flag Officer Submarines was offered training billets at sea for officers and men in the USS *Skipjack* the third American nuclear powered submarine with a pressurized water reactor similar to that used later in HMS *Dreadnought* the Medical Department had two medical officers and four sick berth staff already trained and available for six billets

He had wide sporting and cultural interests He represented Westminster School and Guy's Hospital at football and cricket, and later played cricket for the Incogniti

He was fond of music and particularly latterly adored the work of the French composer Poulenc and taped everything of his that came on the air

On retirement from the Navy he became the first honorary Delegate General of the Edwina Mountbatten Trust, founded shortly after her death to help the St John Ambulance Brigade the Save the Children Fund and the Advancement of Nursing When in 1965 much to Lord Mountbatten's distress he had to retire again because of Lady May's declining health the Trust was flourishing his time in office culminated in the charity premiere of the film *My Fair Lady* which raised £25 000 He took particular pride in the fact that all the money raised went to the Trust It was a world wide organisation reported recently to have raised nearly two million pounds for these charities.

The success of their only son Robin actor opera and theatre critic and author of some 40 books for adults and young people on the performing arts and the American West, including *Operamania* (1956) and *The Gold Rushes* (1977), was a source of continuing pride towards the end of his life

When I last saw him he seemed fitter than for several years he cooked a splendid meal and the last thought in his mind was that the sudden end for which I believe he would have wished, was so near

J roy nav mad Serv 1984 70 43–45

Abstracts

Lovell MJ An initial investigation into the use of carbon fibre reinforced carbon in a post system *Thesis for MSc (Conservative Dentistry)* University of London 1983

An initial investigation was carried out into the bending characteristics of a rigid non metallic material in the form of carbon fibre reinforced carbon (CFRC) as the basis of a post system for restoring endodontically treated teeth Since Fauchard in 1746 described the use of tapered precious metal posts anchored into root canals to retain a prosthesis, there have been many variations in post systems utilised in the attempt to obtain improved retention within the root canal

Of the common methods of retaining post systems threaded screw in dowels, such as in the Kurer post system are more retentive than unthreaded cemented dowels when subjected to tensile forces However threaded dowels impart greater installation stresses than cemented dowels and therefore increase the risk of root fracture It has been shown that the most retentive cemented post shape is a parallel-sided serrated dowel

The majority of post systems in current use require a luting medium for retention although the actual configuration of the individual systems for resisting displacing forces varies

Another factor common to all these systems is that they are metallic being either gold alloys which can suffer from corrosion especially when cast with dissimilar metals The use of non metallic posts has been attempted Wooden dowels were employed by the Franks during the period 200–737 AD to retain artificial crowns and more recently hickory wood posts were utilised in the root canal by Gilney in 1924 Composite resin post and core systems have been described All of these methods have proved unsatisfactory principally because the physical properties of the various materials have been inadequate

Recent technology has produced a biocompatible and rigid non metallic composite in the form of a carbon fibre reinforced carbon (CFRC) which can be formed in various configurations to gain maximum use of its properties A dowel shape suitable for investigation as the basis of a post system has been developed While CFRC has been proposed for use in several endoprosthetic applications eg replacement bone shafts and pins, little consideration has been given to dental applications, although other carbon materials are showing promise in the field of transcutaneous implants at body temperature Isotropic PLTI carbon coated graphite implants and in a lesser extent pyrocarbon

The biocompatibility and strength of CFRC hold great potential in the field of endodontic implants but while the material itself may be suitable for use in a post system because of its physical characteristics the retention of each system may be enhanced by adhesion to the cementing medium employed

The fracture strength of the most commonly used dental cements is less than that of dentine or conventional post materials Therefore failure of the system occurs cohesively within the cement or at the interface with the post or dentine which is usually formed by mechanical interlocking rather than any chemical bond at the interface No published data were found which indicate the potential of dental cements and composite resins to adhere to CFRC The effects of recently developed adhesion promoting agents for use with BIS GMA resins are of interest since they might offer a system in which all interfaces in the dowel-adhesive dentine combination possess high strength and resistance to microleakage

Therefore an investigation was performed into the bond strengths obtained with CFRC dowels using a range of restorative materials currently available The CFRC dowels were manufactured with two different types of surface finish by altering the degree of infiltration of carbon into the carbon fibre matrix A modified Shell Nielsen push test was employed to study the ability of 6 restorative materials (3 dental cements and 3 composite BIS-GMA resin systems) to bond the CFRC rods with stainless steel rods of the same dimensions as controls Stainless steel was chosen as the control since it is utilised in several proprietary post systems

Carefully regulated mixes of the restorative materials were used to form annular specimens on the rods These were then supported in dental stone envelopes An Instron testing machine was used to push test the rods from the specimens to record the progress or the failure of the bond between the restorative materials and the rods The stainless steel rods exhibited significantly higher bond strength with all the restorative materials tested compared to both forms of CFRC rod tested

Proprietary adhesion promoting systems appeared effective in increasing the bond strength between the composite resins tested and both stainless steel and CFRC rods The forces required to produce bond failure in either case were probably in excess of those encoun

level in vivo. It was noted that the blood culture with CFRC was progressive while that with stainless steel was complete.

Further investigations are being pursued using an improved configuration of CFRC dwell with adhesion promoting systems prior to considering use of clinical trials.

Woodman AJ. Resistance to amoxycillin in oral streptococci following repeated high dose oral administration. *Thesis for MSc (Periodontology).* University of London 1983.

Amoxycillin is widely used as an oral antibiotic for prophylaxis during the dental treatment of patients considered susceptible to infective endocarditis. It has been shown that the administration of a 3G oral suspension of amoxycillin one hour before treatment will rapidly provide and maintain bactericidal salivary levels of the drug effective for at least eight hours against those oral organisms frequently demonstrated in post operative bacteraemia and isolated from cases of infective endocarditis. However before repeat of such a dose for further treatment it is strongly suggested that an interval of at least one month should elapse to avoid complications from resistant bacteria induced by the first dose. But many patients in the at risk group, whose dental health and awareness has been shown to be generally poor, may require several sessions of dental treatment to achieve dental health each with prophylactic antibiotic cover.

The study was designed to observe the response of the oral bacteria in particular the oral streptococci frequently associated with infective endocarditis to a single 3G oral dose of amoxycillin and to three such doses repeated at weekly intervals to determine whether the repeated use of the drug was desirable at that frequency. Twenty healthy adult volunteers received either one or three oral doses of amoxycillin as a suspension and gave samples of saliva before and after drug administration for up to 91 days. Saliva was cultured anaerobically upon blood and selective agar to determine the effect of the drug, cultures being counted to provide a quantitative assessment of the whole salivary flora. The salivary streptococci and the salivary streptococci able to grow in the presence of amoxycillin and thus deemed resistant were to 2 mg/l or 40 mg/l amoxycillin.

The single dose subjects (Group A) showed a rapid fall in bacterial counts after amoxycillin confirming the effectiveness of the drug against the oral flora and oral streptococci. There was no significant increase in the numbers of resistant streptococci after the single dose but all subjects showed a pre-existing resistant streptococcal flora in the low concentration of amoxycillin. Baseline levels of bacteria were resumed after 3 days.

The triple dose subjects (Group B) also showed a pre existing resistant streptococcal flora and similar resistance to bacterial counts following each of the three doses indicating that amoxycillin had remained effective against the oral flora and streptococci. However there was an increasing proportion of the streptococci resistant to amoxycillin after each dose. Some subjects showed levels of as much as after the second dose which may be interpreted as having invalidated the third prophylactic dose of amoxycillin. Naturally occurring levels of resistance were resumed after 28 days. Thus although the repeat of the 3G dose of amoxycillin was physically well tolerated by the volunteers, the results suggest that there were some subjects whose level of pre-existing and subsequent antibiotic resistance was such that repeated administration of amoxycillin may not have provided adequate cover against the effects of a bacteraemia following dental treatment. As at risk patients have been shown to harbour high levels of resistant bacteria the use of repeated amoxycillin prophylaxis would appear to be a potential hazard to such patients and cannot be recommended at the weekly interval observed in this present study of healthy volunteers. It is evident that investigation into the levels of resistance to antibiotics occurring within the at risk population would be of value, yet only on an individual basis could such information be employed to assess the hazards involved in repeated high dose amoxycillin prophylaxis for a given patient. Until such methods are simply and reliably available we are best to continue with an interval of one month between appointments as currently recommended by most authorities, or change the antibiotic we use.

Dewar EP, Dixon MF, Johnston D. Bile reflux and degree of gastritis after highly selective vagotomy, truncal vagotomy and partial gastrectomy for duodenal ulcer. *Br J Surg* 1983 **7** 743–50.

Enterogastric reflux of bile has been shown to be associated with chronic gastritis. We have investigated preoperative duodenal ulcer patients and patients treated by highly selective vagotomy, Polya partial gastrectomy, truncal vagotomy and pyloroplasty and truncal vagotomy and gastrojejunostomy to assess the incidence of endoscopically observed bile reflux and gastritis and to quantitate the degree of reflux of bile acids and histologically proven gastritis. The correlation between observed and proven gastritis was poor when the observed incidence of bile reflux was low (preoperative duodenal ulcer, highly selective vagotomy) but was good when the observed reflux was high (partial gastrectomy, truncal vagotomy and drainage). Bile acid concentrations in the stomach were significantly lower after highly selective vagotomy than in preoperative patients and those treated by partial gastrectomy and truncal vagotomy and drainage. The antrum and body gastrin raised before operation did not improve after highly selective vagotomy but antrum showed a tendency to worsen after partial gastrectomy and truncal vagotomy and drainage. Body gastrin after highly selective vagotomy was significantly less ($P < 0.001$) than after partial gastrectomy and less than after truncal vagotomy and gastrojejunostomy and truncal vagotomy and pyloroplasty. The beneficial effects of highly selective vagotomy in the treatment of duodenal ulcer may be enhanced in the long term by reduction of enterogastric reflux and post operative gastritis.

Leigh DR, Smith DJ. A method for monitoring arterial blood gas end and base state during prolonged

environmental studies. *J. appl. Environ. Med.* 1983.**54**(8) 741–3

The use of the lobe arterialized capillary blood for monitoring blood gas tension and acid base state is described. The method was validated against simultaneously taken arterial blood samples and separately against nasal end-tidal (ET) PCO_2 and found to be an effective alternative to arterial puncture. Incidental observations showed that breathing through a mouth piece caused the subjects to hyperventilate, as did the act of blood sampling with most subjects. Nasal ET gas monitoring was found to have less effect on a subject's breathing pattern and was used as the standard against which the effects of the other techniques were judged.

Cruikshanks Boyd DW, Lock WR. Fracture toughness of dental amalgam. *Biomaterials* 1983.**4** 234–42.

The fracture toughness of selected low and high copper content amalgams (Arstaloy, Ease, Sybraloy and Tytin) has been determined using three testing methods. A miniature single-edge-notched three point bend specimen, based on BS 5447 was found to give the most reliable values of fracture toughness, determined both as the work of fracture and as the opening mode plane strain critical stress intensity factor. This method was then used to examine the effect of varying the rate of loading and the hardness of the load cell on these properties.

The non-spherical low copper amalgam, Arstaloy, proved to be tougher under all test conditions than the high copper amalgams. It is suggested that time-dependent plastic flow [illegible] is responsible for this behaviour.

Taylor FW, Dewar EP, Earl [illegible] work after repair of a unilateral inguinal hernia. *Br. J. Surg.* 1983.**70**(9) 599–600.

Ninety seven Royal Naval and Royal Marine officers and ratings undergoing repair of a unilateral inguinal hernia were randomized postoperatively into two groups. A, those who returned to full working duties 21 days after operation. B, those who returned to light duties 21 days after operation and to full duties at 3 months. Patients were reviewed at 3 and 12 months. One patient was withdrawn because of the development of late sepsis. Two patients in group B developed a recurrence of hernia within 1 year. No patient who returned to full duties at 21 days was unable to do any duty assigned to him. In a concurrent trial 119 main civilian patients were treated in the same hospital under identical conditions. All patients were reviewed 21 days after operation and were randomized into two groups. C, those advised to return to work immediately. D, those given no advice. Patients in group C returned to work in a mean of 38 days (range 14–96 days) whereas those in group D returned in a mean of 71 days (range 14–280 days). There was no recurrence of hernia in either group with a 1 in review period. It is considered that there is no contraindication to resuming physical work 3 weeks after the uncomplicated repair of a unilateral inguinal hernia and that active encouragement shortens the interval before return to work.

NAVAL MEDICAL COMPASSIONATE FUND

The Fund is a charity existing to help exclusively needy widows and orphans of Royal Naval medical officers active and retired who were subscribers to the Fund at the time of their demise. Though the number of applicants for assistance in these days of the welfare state is small the Fund continues to help those in need. It is not always possible to make adequate provision for dependents and the Fund may be a valuable lifeline.

Subscriptions (£1·05 per annum), legacies and donations would be welcomed and the form for executing a Deed of Covenant can be supplied to subscribers which will increase the value of contributions substantially.

Anyone interested in becoming a member of the Naval Medical Compassionate Fund can obtain an application form by writing to the Honorary Secretary, **Naval Medical Compassionate Fund, Medical Directorate General (Naval), First Avenue House, Holborn, London WC1V 6HE**

Book Reviews

Blood Loss and Replacement Merlin Marshall and Thomas Bird Pp 142 London Edward Arnold (Publishers) Ltd £13 50

This excellent book is written by an anaesthetist and a haematologist thereby covering both the laboratory and clinical aspects of blood replacement therapy Topics discussed include blood filtration auto-transfusion use of blood products blood and plasma substitutes management of abnormal bleeding and adverse reactions to blood transfusion

The text is clear and concise making it an ideal textbook for both surgical and anaesthetic postgraduate examinations In addition it is a useful reference book for other clinicians who are involved in prescribing blood, blood products or substitutes

The final chapter looks into the future of blood replacement therapy and unfortunately only five pages are devoted to this The authors tend to dismiss the possible future use of synthetic oxygen-carrying solutions suggesting that a better return for effort and money might be obtained by wider dissemination of the knowledge and techniques we already possess

Despite the criticism that a little more of the text might have been used to discuss future developments, this is an excellent manual that could become standard recommended reading for the FFARCS and FRCS examinations

SBM

Emergency Patient Care. Lenworth M Jacobs Jr and Burton R Emmett Pp 368 Collier Macmillan Ltd. £14 50

This is basically a well laid out manual of paramedical care primarily designed for the United States paramedical services It divides itself up into a series of procedures each one dealing with a specific form of treatment or resuscitation The book is further subdivided into sections on abdominal pain, airway obstruction appendicular skeletal injuries behavioural emergencies and cardiopulmonary resuscitation

The illustrations are of a good standard but perhaps a little complicated The text is also well ordered and goes through each procedure in a logical stepwise fashion

However despite this basically good content I do not feel it adds anything new to the already extensive literature available to paramedical personnel

United States paramedics seem to take on far more responsibility than their United Kingdom counterparts and this sort of book can encourage over treatment by inexperienced nurses with its inherent dangers It may prove useful to naval medical ratings about to join ships but only when accompanied by a series of guidance lectures

Most of the terminology is directed towards the United States medical system and in fact the last 80 pages of the 350 page book are purely about the Boston District Ambulance Service and medical legislation in the USA

In summary despite being a well laid out and concise guide for paramedical staff it has only a limited place in the training of Royal Naval Medical Branch ratings

PJS

Multiple Choice Questions for Operating Room and Critical Care Personnel S J Mathai and D L Edbrooke Pp 100 Bristol Wright PSG £4 95

This book comprises five hundred Multiple Choice questions broadly related to the work of the technician in the Operating Department and the A & E Department The authors are both anaesthetists and amongst the collaborators is a Medical Services Officer (Lieutenant British)

The emphasis is towards Basic Sciences and the standard is high The wording is clear and unambiguous and considerable thought has gone into avoiding potentially misleading statements The format is that of a statement followed by four short responses all of which may be true This approach reduces guesswork and increases the challenge Multiple choice examinations for technicians are unfortunately still largely based on the 'Single correct answer' principle To avoid confusion a short general paragraph on Multiple Choice examinations might have been appropriate in this book This standard of the false responses is commendably good with a total absence of the silly and therefore patently wrong answer

The questions are distributed randomly through the book both as regards topic and degree of difficulty This is good for some purposes but several technicians to whom I showed the book stated that they preferred questions grouped by topic and also in rough order of difficulty

Overall I found the book worthwhile and enjoyable It will appeal to both candidates and teachers for City & Guild Examination It tests knowledge rather than understanding but as an adjunct to a course and for final revision purposes it is excellent

RR

Preparation for MRCP Part II Paul Siklos and Stephen Olczak Pp 186 Lancaster MTP Press Limited £9 95
In this short revision book the reader is led through a refreshing selection of new case histories data interpretation clinical slides and x ray plates The idea is not a new one but most of the information is presented in an unusual form, stimulating the student to use lateral thinking which seems to be important in preparing for the MRCP

Some of the material has appeared in the *Hospital Update* articles by the same authors but much of it has been revised and rewritten Although there are only 21 data interpretation questions the answers provide an unusually large amount of information and provide a stimulus for further reading. The x ray plates are supplemented by a useful tutorial (with diagrams) on what to look for when presented with a chest or skull x ray information which is hard to find in radiology texts at this level

The clinical photographs are perhaps the more disappointing part of the book Almost identical slides can be found in other publications or slide collections and many readers will have seen them before. The comparatively few colour plates combined with the expense of their reproduction may make the book unnecessarily costly

The book as a whole is up to date readable and well presented making it essential revision for those shortly to take the written paper of the MRCP Part II

JKR

Practising Prevention Articles from the British Medical Journal Pp 112 British Medical Association £5 00
This book comprises a series of articles each related to a particular sphere of preventive care the articles having recently been published in the *British Medical Journal*. The complete age range is covered in five different chapters and other chapters concern themselves among other things with smoking hypertension pregnancy and old age There are also articles on how others within and without the practice are able to assist in prevention.

The book is of limited value to Royal Naval medical personnel for in the Service screening and counselling are regularly carried out Nevertheless for a general practitioner about to enter the National Health Service it would serve as a useful reminder of the importance of prevention in the health care of the family

CWM

Handbook of Hospital Medicine P J Mitchell P Pinn and C Wren Pp 182 Lancaster MTP Press Limited £4 75
This slim fact-packed volume is a truly successful aspirant to the pocket guide market There are few common topics in acute or outpatient medicine which it does not cover The entries are brief and succinct, mainly in lists with few attempts at discussion All guidance is necessarily didactic but while many points might be arguable none is unsound

The reader will gain helpful advice on practical procedures though adequate supervision will still be needed

H[illegible] and SHOs [illegible] this book. One [illegible] will not be ashamed to have it in his pocket

RJC

Aston's Short Textbook of Orthopaedics and Traumatology 3rd edition Revised by Sean Hughes Pp 294 Sevenoaks Hodder & Stoughton £5 45
The editor of this book states that it is directed towards nurses and undergraduates and perhaps pre-registration medical officers. It is a major revision of a previous text in which an attempt has been made to bring the work up to date The concept is to give an overall view of orthopaedics and traumatology and it has its own particular method of presentation which is effective. Unfortunately it is competing against other books of considerable worth although it does include sections on head, chest and abdominal and genito urinary injuries which do not normally appear in these textbooks. In this respect it has a very definite place in the day to day reading of those towards whom it is aimed However I cannot recommend it unreservedly as there are a number of editorial errors and one or two errors of fact which I find it difficult to accept Furthermore I feel that the balance is wrong in certain sections particularly in the orthopaedic section For example rheumatoid arthritis is covered in 2½ pages whereas four pages are devoted to poliomyelitis a condition which is now fortunately very rare

One hopes that in any future edition the editorial errors can be eliminated and a more sensible balance between the sections achieved as the overall concept of the work has much to recommend it

JB

The Health Care Manual Edited by John Fry and Gordon Fryers Pp 320 Lancaster MTP Press Limited £3 95
The Health Care Manual achieves what it sets out to do—in present in simple terms an explanation of common health problems self treatment and when to seek advice Indeed the sub-title of the volume is *A Family Guide to Self Care and Home Medicines* but there are two other sections devoted to prevention and collaborative care

The section concerning common problems suitable for self-care is set out under the diagnoses with paragraphs explaining the condition the causes the type and degree of self-care suitable and when to seek professional advice The section entitled Collaborative Care also includes paragraphs on the importance and effects of the condition and a treatment plan Under Home Medicines there is a therapeutic index suggesting medicaments for common conditions a product information index and a general index

This book would prove of value to the average family as a handy reference for the self medication of common ailments and as a simple explanation of the co-operative management of some more serious or chronic diseases

CWM

Neodymium Yag Laser in Medicine and Surgery Edited by Stephen N Joffin Myron C Muckenheide and Lawrence Galdman. Pp 282. New York and Amsterdam: Elsevier Science Publishing Co Inc. $50.00

This book deals with the very specialised but rapidly growing field of lasers in medicine and surgery. It presents a multidisciplinary approach to the use of the Nd Yag Laser which was initially introduced for endoscopic coagulation of upper GI tract bleeding but which now has applications in ophthalmology, urology, pulmonary medicine, neurosurgery, general surgery, gynaecology, otorhinolaryngology and dermatology.

The book comprises 79 chapters ranging from the early development of the Yag Laser through the specialist applications to the safety aspects for the surgical application of lasers. Each chapter is the work of specialists/pioneers in the field and reports their contributions to the proceedings of the first international ND-Yag Laser Society Conference in Cincinnati in October 1983. It is therefore very up to date and the editors are to be congratulated on producing it so soon after the conference. However, because it is in the form of the proceedings of the conference the presentation is based upon papers presented from various departments describing their studies and the results they have achieved. Dealing with the research in clinical applications in this manner makes it an even more specialised publication and it is therefore of most value to department researching into lasers rather than being an easy to read text. Most chapters also have a good bibliography in order to go in depth reading around specific research projects.

The typescript of the major part of the text is very small and so rather off putting and the index is printed in such a type which though it may look attractive is not conducive to easy reading.

The editors recommend the book for those working or likely to work in the field of laser surgery and I can only agree with this statement. Because of its specialist nature and format this book cannot be recommended for general clinical reading in medicine.

EPD

Management of Wilderness and Environmental Emergencies Edited by Paul S Auerbach and Edward C Geehr. Pp 768. Collier Macmillan Limited. £60.00

The editors of this large and expensive volume direct be is purpose as 'providing the clinician with a body of knowledge concerned with the interaction between people and the natural environment'. The text is intended to serve emergency and primary care physicians as a definitive therapeutic guide to pre-disaster planners, medical assistants with an interest in wilderness medicine and to office nurses and paramedic personnel. A background in the health consequences of environmental stress.

In 21 chapters the book covers a very diverse field, high altitude, heat and cold, skiing, diving and swimming, hazardous marine life, arthropods, snakes, [illegible] mammals, insects, plants, burns, lightning and [illegible] disaster planning, smoke inhalation, radiation accidents and aerospace medicine. In drawing together in one book the effects of the sun, the sea, the sky and most that moves within them the editors have undertaken a massive task. They have produced an excellent reference book with sufficient detailed information on cause, prevention, diagnosis and treatment to be of real value although it cannot be definitive on all topics.

Experts in the individual subjects will find some of the chapters superficial. This is inevitable in trying to cover in a single chapter subjects about which books have been written, but this book is not intended for those who are already experts and no-one can be expert in all topics. All chapters are supported by comprehensive reference sections giving guidance on more detailed study. This book would be a valuable addition to the ship's medical library covering as it does so many topics with which the naval doctor might well come into contact but about which he will have great difficulty in finding much information without ready access to specialist sources and libraries. It is well written and clearly printed with excellent illustrations and it is difficult to imagine the naval doctor who would not find himself browsing unanxiously in this book during long evenings at sea. The doctor going on an expedition will certainly be wise to study it before departure but may think twice about taking it with her if she has to carry it herself.

There are several chapters which seem out of place in a book which is clearly destined purpose. The appendix on radiation accidents and the chapters on disaster planning, aerospace medicine, lightning, burns and wildland fires are within not likely to be of great interest to those at whom the book is aimed, or the subjects will be more comprehensively covered elsewhere. Thus the book might have been reduced to a more manageable size to make it more widely read and appreciated as it deserves for its subject matter is full of interest to a wide audience and excellently treated.

DSW

Bailey and Bishop's Notable Names in Medicine and Surgery 4th edition. Revised by Harold Ellis. Pp 288. Lancaster: H K Lewis & Co Ltd. £15.00

Almost an interval of 24 years Professor Ellis has produced a fourth and updated edition of the book of famous names in medicine and surgery originally published in 1944. Those of us brought up on Bailey and Love's *A Short Practice of Surgery* will be familiar with the historical footnotes and Hamilton Bailey—a surgeon who served with the Royal Navy and saw action at Jutland—combined with William Bishop—a distinguished medical librarian and historian—to produce this book is still more about Addison, Collis, Bell, Spencer Wells and the many others who are so familiar to doctors through their eponymous diseases, instruments, anatomical descriptions and the like.

Potted histories of 60 names are included in 255 pages and there is a short bibliography and good index. In the space available this historian can be no more than

appetizers, but this revised edit on [illegible] invaluable to th student who want [illegible] h at the men behind the name

DSW

The Story of a Naval Doctor R W Mussn Pr vately publ shed

There can be few naval medical officers who have not at some time or nthn had the nige to pnt pen t p-per and record at least some of their experiences at sea and ashore As far as I am aware, none have had the courage to do so of if they have, publishers have not been forthcom ng Surgeon Rear Admiral R W Mussen has done just this in his privately published *The Story of a Naval Doctor*

This book is not a series of anecdotes but a highly personal account of one medical officer's career covering the years 1922–55 years of great change not only for the Medical Branch but for the Royal Navy Before the Second World War life was infinitely more leisurely hours and coats were worn the opportunities for travel were limitless and the pressure to obta n higher qualifications in [illegible] although the [illegible] and [illegible] the MRCP but also an MD

The most interesting and stimulat ng time for Admiral Mussen must have been as Med cal Officer in Charge of the Medical School at a time when Admiral Dudley was anxious to pursue his grandiose ideas for medical research in the Royal Navy—ideas which have surely now come to fruition The author describes in detail the move from Clevedon to Monckton House and explains why he thought it necessary to introduce a course in nuclear physics for medical officers although he confesses I cannot say I ever mastered the subject and certainly found the lectures sleep-making

Admiral Mussen has kindly g ven copies of the book to the libraries at RNH Haslar and Plymouth where I am sure they will be read with great interest by those who knew him and by younger officers wishing to learn more about this important period in the development of the Royal Naval Medical Service Copies are also available from Admiral Mussen at Clevedon 40 Lewis Road Dunal ng Sussex BN5 8TU price £6 00 plus 75p pack ng and postage

AER

DEFENCE COUNCIL INSTRUCTIONS

Recent medical and other relevant DCIs are given below

DCI RN 180/83	Uniform RN ratings and QARNNS male ratings
DCI RN 181/83	Uniform RN and RNR ratings
DCI RN 191/83	Training Ratings RNMSS Course dates 1983 84
DCI RN 223/83	Revision of eyesight standards hydrographic surveying service and non seamen Officers—periscope watchkeeping duties
DCI Gen 40/83	Head of Defence Radiological Protection Unit—Terms of Reference
DCI RN 250/83	Training QARNNS ratings
DCI RN 261/83	Promotions to CMT
DCI RN 281/83	Training—General—First Aid
DCI RN 286/83	Discharge of Naval Ratings—Assessment and recommendation for further Naval Service
DCI RN 301/83	Sick Berth Petty Officers Efficiency Medal
DCI RN 309/83	Amendment to 191 83—course dates at RNMSS
DCI RN 368/83	Selection boards for promotion to CMT
DCI RN 391 83	Hearing standards EW ratings
DCI RN 393 83	Medical Assessment—Patheenis and relevan medicals of senior officers
DCI RN 396/83	Ruth Cutler prize for nurses
DCI Gen 66 83	Health and Safety at Work Act
DCI RN 416 83	Malaria—change of medication
DCI RN 439 83	Training Medical Branch Ratings, RNMSS course dates 1984
DCI RN 427/83	Annual S264C reports on RN QARNNS and WRNS ratings
DCI Gen 79 83	Eyesight screening for users of VDUs
DCI Gen 83/83	Health and Safety at Work Act (Asbestos)
DCI Gen 84/83	Health and Safety at Work Act —Polychlorinated Biphenyls
DCI RN 493/83	Advance Information Leaflets
DCI RN 518/83	Training—Institute of Naval Medicine—course to be held in 1984

Letter to the Editor

Dear Editor

Thank you for your enquiry about the **Royal Naval Sick Berth Branch Centenary Celebrations in 1984**

The centenary year will be marked by celebrations in all three naval hospitals and all members of the Branch past and present with their families will be most welcome to attend. At the moment some arrangements are awaiting confirmation but are planned as follows:

RNH Plymouth

Saturday 21 July 1984	Open day at the hospital. Events to include historical exhibition and tours of the hospital, concert by a band of the Royal Marines, football match versus Plymouth Argyle.
pm	Civic Reception by His Worship the Lord Mayor, followed by a Centenary Dance at the Guildhall, Plymouth. (Dress for serving members uniform, ex service lounge suit.)
Sunday 22 July	Interdenominational service of thanksgiving and dedication of a Book of Remembrance in the Church of the Good Shepherd. Buffet lunch and refreshments will be available in the messes.

RNH Haslar

Friday 24 August	Civic Reception at the Town Hall by His Worship the Mayor of Gosport followed by an informal social evening at the Haslar Club.
Saturday 25 August	Hospital Museum and Library open to visitors. Conducted tours of the hospital. Cricket match between serving members team and an ex service members team. Centenary Dance in the Thorngate Hall, Gosport.
Sunday 26 August	Interdenominational commemoration service and unveiling of a Commemorative Plaque in St Luke's Church followed by a buffet lunch in the Senior Rates Mess. Hospital Museum and Library open to visitors. Conducted tours of the hospital. An informal evening farewell gathering at the Haslar Club.

RNH Gibraltar

Wednesday Centenary dinner dance.

17 October

The social events have to be self-financing and every effort will be made to keep costs to a minimum. There is no intention to make a profit but any money left over at the end of all the celebrations will be donated to the Sick Berth Petty Officers' Efficiency Medal Fund. Permission has been given for a special fund known as the Sick Berth Staff Centenary Fund to be set up to pay for the Book of Remembrance, the Commemorative Plaques and other official costs. The Fund has received donations from the Staff Welfare Funds of the hospitals and from individual serving members. Anyone who wishes to make a personal donation should forward it to the **Treasurer, The Sick Berth Staff Centenary Fund, Royal Naval Hospital, Haslar, Gosport, Hants PO12 2AA.**

The Book of Remembrance planned for RNH Plymouth is to record the details of Medical Branch personnel who died whilst serving. Members of the Branch, both serving and retired, are requested to pass on any information they may have to the Chairman of the Centenary Committee at RNH Plymouth in order to ensure that the book is as complete as possible.

If the Centenary is to be a success, it is vital that the planned events are given wide publicity. The Public Relations Departments of the Service are doing their part but retired members can assist by passing on details to others. Former members of the Branch are invited to write to the local committees at each hospital with requests for further information.

Yours sincerely

Colin Cahurn

Lieutenant Commander, Royal Navy

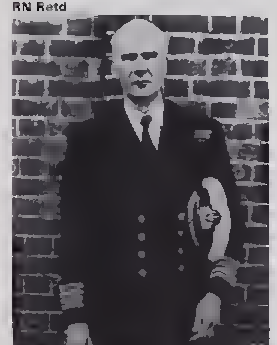
Chairman, Royal Naval Sick Berth Branch Centenary Committee

RNH Haslar

SERVICE NEWS

OBITUARIES

SURGEON CAPTAIN T L CLEAVE FRCP RN Retd



Surgeon Commodore G J Milton Thompson writes

Peter Cleave died in the Royal Naval Hospital Haslar on 15 September 1983 at the age of 77.

Educated at Clifton Bristol University and St Mary's Hospital he qualified in 1928 and entered the Royal Navy the same year. His first appointment being to HMS *Pembroke*. Other appointments included HMS *Argus* HMS *Penelope* and HMHS *Maine*. He obtained the MRCP in 1936 and after three years at the Naval Hospital Hong Kong, was appointed in 1940 to *HMS King George V* as PMO. It was while serving in *King George V* that he was able to put his early ideas into practice by arranging for supplies of coarse bran to be issued to the ship's company. In real increment ruined to respect when the results began to be appreciated.

After the war he served at RNH Chatham RNH Haslar and in HMS *Drake*. He was promoted Surgeon Captain in June 1953 and subsequently served as Director of Medical Research at the then RN Medical School Haslar and in HMS *Dolphin* and *Drake*. He retired from the Royal Navy in February 1962.

During his Service days Cleave thought deeply on the relationship of dietary habits to disease but his first publication was not until 1956 in this *Journal*. After his retirement however he devoted much time and thought to his hypothesis and his contribution to medical science is assessed in this issue by other more distinguished contributors.

A prophet with little honour in his own Service during his active career his contribution was recognised by the Navy and the Royal Colleges after retirement with the award of the Gilbert Blane Medal and by the Royal Institute of Public Health whose Hauben Gold Medal afforded him great pride and pleasure. He was elected FRCP in 1976.

He is survived by his devoted wife Helen a son and two daughters and by his younger brother also a Surgeon Captain to all of whom we extend our deep sympathy.

Mr Denis Burkitt CMG FRS The Medical Research Council writes

Peter Cleave was one of the most revolutionary and farsighted medical thinkers of the present century seeing far beyond the small system of intricate details of individual diseases. His outstanding contribution to medicine was the recognition that many of the commonest and major diseases occupying doctors time and filling hospital beds in western countries were characteristic of lifestyle and consequently were potentially preventable if causative factors could be reduced or eradicated. Although a few others have also recognised that these diseases were characteristically western Cleave was the first to accumulate through much painstaking and persistent work evidence not only incriminating diet as a causative factor but putting particular blame on the refining of carbohydrate foods with resultant excess of sugar consumption and a deficiency of fibre intake. Cleave also considered these diseases as manifestations of maladaptation to a new environment.

The recognition that characteristically western diseases could be reduced or eradicated by changes in lifestyle is as great an advance in this century as was the recognition in the 19th century that infective diseases could be reduced by identifying and reducing their causes.

For many years Cleave was a voice crying in the wilderness for his ideas were too radical to attract serious

[illegible] but late in his life their acceptance was demonstrated by the bestowal on him of both the Harben Gold and Gilbert Blane Medals.

His major seminal paper was published in the *Journal of the Royal Naval Medical Service* in 1956 under the title The Neglect of Natural Principles in Current Medical Practice. Like so many really important articles his original contribution never received the attention which it deserved. Captain Cleave's perception [illegible] and [illegible] altered the whole course of my medical [illegible] and I consequently owe him a debt of deep [illegible].

Sir Francis Avery Jones CBE Honorary Consultant Gastroenterologist to the Royal Navy writes

When the medical achievements are reviewed and assessed in the year 2000 I believe that two names will stand out as having made the most impact on world health in the 20th century. Florey for the discovery of penicillin and opening up the antibiotic era which led on to bringing so many infectious diseases under control. Cleave for his recognition of the hazards of unwitting [illegible] from eating refined foods which provided the key to the control of the 20th century pandemic of [illegible] diseases of civilisation. By the turn of the century Cleave will not again be remembered as [illegible] will his name be linked with dietary fibre. [illegible] with sailors at sea with bran [illegible] and [illegible] medium [illegible] including Dimock in 1936 had previously [illegible] the use of bran for constipation and written [illegible] papers [illegible] Cleave's use of bran made him [illegible]. He asked himself a question which no-one had [illegible] before. What was the effect on health of [illegible] constituents such as [illegible] end fibre. As a result of the industrial [illegible] in the 19th century this could now be done so [illegible] mainly in the quest for more interest in foods. He [illegible] at the problem against his background as a [illegible] having [illegible] animals in their [illegible] habitat. He realised how well they were adapted [illegible] to their environment and particularly to [illegible] food. He knew the hazards to their health and [illegible] from [illegible] in their diet. Perhaps man [illegible] adapted to his food over the aeons of evolution. He realised that refining of man's food on a grand scale would lead on to unwitting overnutrition with the hazards of obesity and all its consequences. The concept of the Saccharine Disease took shape. On the one hand he defined the problems which would stem from an easy excess of soluble carbohydrates and on the other the problems for the alimentary tract from the stripping of protein and fibre with the possible increased risk of developing peptic ulcer, diverticular disease and appendicitis. It was a theory staggering in its simplicity. [illegible] before the year 2000 time will have [illegible] confirmed the Cleave hypotheses and over refinement of food will have become part of our history. His name will be added to the roll of the great men who opened up new fields of discovery in medicine.

Dr Kenneth Vickery Vice President Royal Institute of Public Health writes

During 1978 it fell to the Council of this Institute to give attention to the triennial exercise of nominating a worthy recipient of the Harben Gold Medal for eminent services in the advancement of the public health.

In making the selection the Council was conscious that the work of the person honoured would be likely to measure in history alongside that of such previous recipients as Pasteur, Koch, Gowland Hopkins, Fleming and Florey.

In 1965 Sir Richard Doll later himself to be a Harben gold medallist, wrote a foreword to a book presenting epidemiological studies in human nutrition contributed by a relatively unknown naval medical officer who had been amassing evidence, in the face of no little hostility from the medical establishment, for at least some 30 years. Sir Richard Doll observed that the value of a scientific hypothesis lies less in the number of observations that it can explain than in the number that it can successfully predict. He contended that if only a small part of the author's predictions proved to be correct a greater contribution to medicine would have been made than most research departments make in the course of a generation.

The man behind that work, and further reinforced in his 1974 The Saccharine Disease was Surgeon Captain Peter Cleave. By the early 1970s informed opinion in America was accepting that Cleave's hypotheses were likely to be sound. Accordingly Peter was invited by Senator George McGovern in 1973 to give evidence in regard to the consequences of refinement of foods before the US Senate Select Committee on Nutrition. By the late 1970s Cleave's contentions, which in some respects turned conventional views on prevention and treatment upside down, were increasingly accepted in the UK and the Council of the Royal Institute of Public Health was unanimously desirous of being among the first to recognise the potential of Cleave's contribution. Happily in the course of making presentation arrangements the Institute learned that the Royal Navy in association with the Royal Colleges was awarding him the Gilbert Blane Medal. All of which led to a memorable occasion of dual presentation in the Medical Mess at Haslar in June 1979.

Peter Cleave would be insistent that any mention of him was pointless unless the essence of his essential message was reiterated. This message which still has a long way to go in understanding and implementation is that the refining out from the predominantly carbohydrate foods of fibre, vitamins, minerals, trace elements and protein has grievous consequences upon the health of the consumer. He grouped together as a master disease a wide range of conditions embracing dental, peptic and diverticular disease together with carcinoma of the colon, haemorrhoids, varicose veins, deep vein thrombosis, diabetes and coronary thrombosis.

The aetiology on the one hand was mechanical, arising from deficiency of fibre and bulk, and on the other hand consequent upon overconsumption engendered by the same removal of bulk from the highly calorific remaining nutrients.

[illegible] remembered [illegible] aspect of his work.

For whatever he is remembered [illegible] of the unique opportunity afforded [illegible] Naval Medical Service, which provides [illegible] observation upon respective communities [illegible] relation to nature and dietary habits and [illegible] of James Lind of ships companies captured in a table that [illegible]

SURGEON CAPTAIN P DE B TURTLE OBE VRD MA BM BCh FRCGP DPH RNR Retd

Peter Turtle died suddenly at his home in Hertford on 1[illegible] August 1983 on the eve of his 72nd birthday.

The son of a doctor he was educated at Haileybury, Hertford College Oxford and St Thomas's Hospital where he qualified in 1936. He joined the RNVR the same year and served as a Surgeon Lieutenant Commander during the Second World War after which he returned to general practice in Wimpole Street. He was promoted to Surgeon Captain in 1958 and appointed QHS in 1960. In September 1954 he joined the staff at Haileybury where he was Medical Officer for 20 years. He became Secretary and subsequently President of the Medical Officers of Schools Association. In 1975 he was made an Officer of the Order of the British Empire, and also an Officer of the Order of St John of Jerusalem.

His many interests included the British Red Cross Society, the Sea Cadet Corps, dramatics and the Sherlock Holmes Society of which he was a founder member. An excellent shot and twice winner of the Naval Reserve Championship, in his retirement he became President of the RNR Rifle Association and Vice Chairman of the Cadet Council for Rifle Shooting.

He married in 1938 and is survived by his wife, Kathleen, and their son and daughter.

SURGEON CAPTAIN (D) D L GOODRIDGE QHDS FDSRCS Edin RN Retd died aged 70 on 13 September after several months of disabling illness

Surgeon Captain (D) G D Sharpe writes

Derek Leslie Goodridge qualified from Guy's Hospital in July 1937 and joined the Royal Navy as a Surgeon Lieutenant (D) in January 1938. In line with the normal pattern his first few years were spent as dental officer in a mixture of shore and sea appointments. Following promotion to Surgeon Lieutenant Commander (D) in 1943 he spent the latter part of the war from 1944-46 in HMS *Sultan* on the East Indies station and was additionally dental officer on the staff of the Supreme Allied Commander SE Asia, Admiral Mountbatten.

After the war Derek spent some five years in Scotland and it was while in HMS *Cochrane* in 1949 that he obtained the Higher Dental Diploma of the Royal College of Surgeons of Edinburgh. At that time the HDD was the only postgraduate dental diploma available to the aspiring hospital dental specialist as the Fellowship in Dental Surgery barely existed. However 20 years later in 1969 his HDD was converted automatically to FDSRCS Edin.

[illegible] Commander [illegible] He came to [illegible] December [illegible] 1951 Derek [illegible] to take up appointment [illegible] dental specialist [illegible] RNH Bighi, Malta. This [illegible] succession of dental specialist appointments in naval hospitals which were to fill most of his remaining career in the Service. During this period he served in Malta, Chatham, Stonehouse and Haslar hospitals. It was also during this period that he was promoted Surgeon Captain (D) in June 1960. In January 1968 Derek was appointed to the then RN Medical School as Director of Dental Studies and Research and soon after was made Queen's Honorary Dental Surgeon.

He retired from the Royal Navy in September 1969 but notwithstanding his full and notable Service career he then embarked on a second one as Director of the Dental Hygienists Training School at the Cardiff Dental Hospital, a post he held for several years until reaching compulsory retirement age.

Those who knew Derek well will remember most his quiet charm backed by an equally quiet but ever-present sense of humour. These he bestowed on patients and colleagues alike and they stayed with him even through the difficult days of his final illness.

To Joan and family we extend our deepest sympathy.

SURGEON CAPTAIN (D) B F S POPHAM LDS RN Retd died at the Gosport War Memorial Hospital on 27 August 1983 at the age of 68

Surgeon Rear Admiral (D) A E Cadman CB writes

Ben, as we all knew him, began his Service career during the war after qualifying at Manchester Dental School. He entered in 1940 as a Temporary Surgeon Lieutenant (D) RNVR as we all did in those days and was appointed to RN Barracks Chatham. But he was soon off to sea joining HMS *Argus* in 1941 at the height of the submarine war against our convoys. He came through it all unscathed and in 1945 had the good fortune on being appointed to HMS *Saker* to find himself serving in New York City for duty at the Brooklyn Navy Yard as my relief. Unfortunately for him the sudden ending of the war later that year cut short any thoughts he had of spending two years enjoying the bright lights of Manhattan. But as a bachelor and a dentist he must have been delighted with his next appointment to sea in HMS *O*[illegible] in which he served for almost four years, during which period of his career he transferred to the Permanent List and was promoted Surgeon Lieutenant Commander (D).

Coming ashore in 1950 he continued to serve with the Fleet Air Arm at RNAS Culdrose but subsequently moved to the RN Barracks Devonport in 1952. During this time not only was he further promoted to Surgeon Commander (D) but he met and married June, daughter of Surgeon Rear Admiral Cullinan. They were soon to go to Singapore in HMS *Terror* for a happy commission of three years where they formed many lasting friendships. Back in the United Kingdom Ben was to serve in a number of shore appointments mainly in training establishments such as HMS *St Vincent* and HMS *Ganges* where his ability to organise and to train

young dental officers was soon recognised. He was rewarded by being promoted Surgeon Captain (D) in 1965 and in that rank served on the staff of FONAC and of CINCNAVHOME before retiring in 1972.

That was not the end for Ben as far as dentistry was concerned for with a young family still to support he joined the School Dental Service as it was then known, and continued to work for the Local Authority for the next ten years until failing health eventually forced him to retire completely.

Ben loved naval life and considered himself fortunate as a dentist to have spent so much time at sea in his early days but at heart he was a family man and in time came to take pride and pleasure in the progress of his young family through school to adulthood. His interests were many and like his work his hobbies were undertaken with meticulous attention to detail. Not gifted athletically his interests were to be found mainly in the arts, especially music, and he was the possessor of a fine collection of classical records and concert programmes, also a stamp collection he had built up over many years. Gardening was his lifelong outdoor passion and his large garden at Alverstoke was well known for its blaze of colour each year. But latterly ill health caused him to restrict even this activity for less strenuous pursuits. He turned his attention more than ever to his interest in local politics and to freemasonry from which he derived a comradeship and philosophy of life, which fortified him in his final illness which mercifully was short. He died peacefully in his sleep.

To his wife Jane to his son and to his daughters we extend our sympathy.

SURGEON CAPTAIN A LONG MRCS LRCP RN Retd died on 14 December 1983 at the age of 79

Arthur Long entered the Royal Navy in 1930 as a Surgeon Lieutenant for a Short Service Commission transferring to the Permanent List in 1934. He was promoted Surgeon Lieutenant Commander in June 1938 and Surgeon Commander in 1942. His wartime appointments included the RN Sick Quarters Gamlock and the hospital ship *Isle of Jersey*. After a short period at RNH Chatham he joined RNH Plymouth where he held the post of Senior Genito urinary Specialist until 1952. Following two years at RNH Malta he was promoted Surgeon Captain in December 1954 and subsequently served at RN Barracks Chatham. In January 1957 he was appointed President of the Admiralty Medical Board where he remained until his retirement in 1961. Later that year he took up an appointment as Final Examining Medical Officer (Civilian) at the London Recruiting Office.

SURGEON COMMANDER W B TEASEY MB BCh BAO RN Retd died on 26 September 1983

William Bennett Teasey was born in Lurgan Northern Ireland on 23 April 1908 and qualified at Queens University Belfast in 1936. He entered the Royal Navy as a Surgeon Lieutenant in 1937 his first appointment being to HMS *York*. During he was he served at RNH Haslar and at RNATE Newcastle under Lyme and his later appointments included HMS *Heron* HMS *Seahawk* and HMS *Caledonia*. He was placed on the Retired List on medical grounds in September 1959. Subsequently he took up an appointment with the RN & RM Careers Office, Newcastle upon Tyne and made his home in Alnwick in Northumberland.

SURGEON COMMANDER (D) C J WILKINSON LDSRCS(Eng) RN Retd

Surgeon Captain (D) D A Coppock writes

Christopher John (Kit) Wilkinson died on 30 September 1983. He was educated at Epsom College, and arrived at Guy's Hospital as a dental student in the autumn of 1950.

A tall craggy humorous man, he was soon involved in a wide variety of extramural activities ranging from rugby and water polo to amateur theatricals. He fenced for London University and his commanding physical and mental presence made an indelible mark on his fellow students.

He qualified in 1954 and after a house appointment joined the Royal Navy. He served in a variety of UK shore bases as well as in HMS *Terror* and HMS *Blake*. The Navy benefitted from his drive and enthusiasm in diverse activities and his unquestionable intellect was amply demonstrated when he became the runner-up in the Brain of Britain competition.

Kit retired from the RN at his own request in 1971 and went into general dentistry in Petersfield before moving to the Middle East where he practised in Bahrain and Qatar.

His restless probing brain dipped into the full spectrum of what life has to offer and it was difficult to find a topic on which Kit could not contribute well informed views.

His loves a wife Catherine and five sons.

SURGEON LIEUTENANT COMMANDER (D) JOHN BUNYAN LDSRCS(Eng) RN Retd

died on 3 December 1983 and an obituary will be published in the next issue of the Journal.

RN MEDICAL AND DENTAL OFFICERS

HIGHER QUALIFICATIONS

Surgeon Captain D S Wright—FFOM
Surgeon Commander (D) A J Woodman—MSc (Periodontology)
Surgeon Lieutenant Commander A F A E Mared th—FRCS(Glas)
Surgeon Lieutenant Commander (D) W Somerville—FRCS(Ed)
Surgeon Lieutenant Commander (D) M J Lovell MSc (Conservative Dentistry)

Southern Ophthalmic Society

Surgeon Captain A J Rintoul FRCS Head of the Ophthalmic Department RNH Haslar and Consultant Adviser in Ophthalmology to MOD(N) has accepted the invitation of the Southern Ophthalmic Society to be Vice President for 1984 and President the following year He is the first RN medical officer to be so honoured

Surgical Research Society

Surgeon Lieutenant Commander P J Shoulder MBE FRCS has been elected a member of the above Society

PROMOTIONS

To Surgeon Lieutenant Commander
R Adlny T J R Francis D A Veasey

To Surgeon Lieutenant Commander (D)
S I Reeves

To Surgeon Lieutenant
Mrs B J Conroy A J G Donovan K J Watson

To Acting Surgeon Lieutenant
M Cuget A G Hilary M M Parrish

Provisional selections for promotion to date 30 June 1984

To Surgeon Captain
R C Clark

To Surgeon Captain (D)
J W G Pidgeon

To Surgeon Commander
D H M B Doyle A R Magridge C J Churcher Brown O M Howard P F R Tolley

To Surgeon Commander (D)
S Lambert Humblin

TRANSFERS TO FULL CAREER COMMISSION

Surgeon Lieutenant Commander T J R Francis
Surgeon Lieutenant Commanders (D) G L Morrison R C Sanderson
Surgeon Lieutenants P A Glew C J Stoot

TRANSFERS TO MEDIUM CAREER COMMISSION

Surgeon Lieutenant Commanders L J Jarvis T R D Riley
Surgeon Lieutenants R J Clark, S D Evans C F Swinhoe A J Walkin S Q M Tighe

NEW ENTRIES

Surgeon Lieutenant C T Braithwaite

Acting Surgeon Lieutenant P J Mann
Surgeon Sub-Lieutenants P R Davis O L Greenslade M A Howell R A Ross, Miss S J Murray
Surgeon Sub-Lieutenants (D) N B Baker C G Hardman Miss M M Wilkins

PLACED ON RETIRED LIST

Surgeon Commander B J Addis
Surgeon Commander P F Ball
Surgeon Commander A J Johnson
Surgeon Commander P I M Urwin
Surgeon Lieutenant Commander D Morgan
Surgeon Lieutenant Commander J A Robertson
Surgeon Lieutenant Commander R J H Robertson

PLACED ON EMERGENCY LIST

Surgeon Lieutenant Commander K S Lloyd
Surgeon Lieutenants S M Arnold A T Cope A C Hunt K M R Van Terheyden
Surgeon Lieutenant (D) R A S Baxter

MEDICAL SERVICE OFFICERS

PROMOTIONS

To Lieutenant Commander (MS)
R A Pollard

To Lieutenant (MS)
A Harrington M J Hazell

To Sub-Lieutenant (MS)
M W White

To Sub-Lieutenant SL (MT)
L S Dunkerley R J Holyoak

ROYAL NAVAL RESERVE

Reappointed Queen's Honorary Surgeon 1 January 1984
Surgeon Captain J Shaw ADC RD

PROMOTIONS

To Surgeon Lieutenant Commander
S C Stanley

To Surgeon Lieutenant Commander (D)
S M Black

RETIREMENTS

Surgeon Lieutenant Commander A Ginn
Surgeon Lieutenant Commander M J Harrison
Surgeon Lieutenant Commander I N Hudson RD

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

New Year Honours

Associate of the Royal Red Cross
Miss M K Humphreys Superintending Nursing Officer

PROMOTIONS

To Chief Nursing Officer
Miss V C Fisher

To Superintending Nursing Officer
Miss J C Brown Miss S L McConnell
Miss E M Weall

To Senior Nursing Officer
Miss M A Bibeau Mr F M McArthur

NEW ENTRIES

Nursing Officers Miss K E Guthford Mrs J A Nash,
Miss B C Smith

RETIREMENTS

Chief Nursing Officer Miss F V Wade ARRC
Superintending Nursing Officer Mrs B A Johnson
Superintending Nursing Officer Miss S Smith

NOTICE TO SUBSCRIBERS

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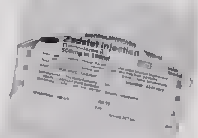

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No 2 Summer 1984 Vol 70

JOURNAL of the ROYAL NAVAL MEDICAL SERVICE

(The Ministry of Defence (Navy) does not accept responsibility for the opinions expressed in this Journal)

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Notice to Authors

Contributions should be submitted to the **Editor, Journal of the Royal Naval Medical Service, Royal Naval Hospital Haslar, Gosport, Hants PO12 2AA,** who will arrange for any necessary security clearance. The attention of Medical Branch personnel is drawn to the provisions of QR&RN Appendix 35 J.

Manuscripts should be prepared in the Vancouver style.[1] They should be typewritten with double spacing and wide margins and should include title page, abstract (of not more than 150 words), introduction, method, results, discussion and references, each section commencing on a separate page. A convenient length is between 2000 and 3500 words, plus essential tables or illustrations.

Tables and illustrations should be referred to in the text. Tables should be typed in double spacing on separate sheets. Figures should be professionally drawn, making due allowance for the appropriate reduction. Glossy black and white photographs should be submitted unmounted whenever possible. Titles and detailed explanations should be given in the legends which should be typed on a separate sheet.

References should be numbered consecutively in the order in which they are first mentioned in the text. At the end of the article the full list of references should give the names and initials of all authors (unless more than six, when only the first three should be given followed by *et al.*). The authors' names are followed by the title of the article, the title of the journal abbreviated according to the style of *Index Medicus*, year of publication, volume number, and first and last page numbers. Titles of books should be followed by the place of publication, the publisher, and the year, e.g.

> Soter NA, Wasserman SI, Austen KF. Cold urticaria, release into the circulation of histamine and eosinophil chemotactic factor of anaphylaxis during cold challenge. *N Engl J Med* 1976 **294**: 687–90
> Osler AG. *Complement: mechanisms and functions*. Englewood Cliffs: Prentice Hall 1976

1 The Vancouver style. *J roy nav med Serv* 1979; 65: 179
2 International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. *Br Med J* 1982; **284**: 1766–70

Single copies £3.50 (RN & RNR £2.80)
Annual subscription £10.00 (RN & RNR £8.00)

A ... [illegible] ... the Op... [illegible] ... and then to be ... [illegible] ... the plant rooms wh... service the Operating Department. Access to the Acc... [illegible] ... and Outpatient Departments is from beneath the overhang of the Operating Room.

Editorial

THE redevelopment of the Royal Naval Hospital Haslar progresses slowly onward another mile stone having been reached since we last went to press.

Some fourteen years ago the Medical Officer in Charge RNH Haslar was tasked to submit the requirements to provide a 485 bedded Naval Hospital on the site of the existing hospital taking account of the needs over the next ten years and assuming that the complement of staff remained unchanged! This resulted in a Feasibility Study to look at the desirability of redeveloping the existing structure *in a ws* a new build

In 1972 the decision was made that it would be more cost effective to redevelop the existing site and buildings hence early in 1973 planning was commenced with some degree of enthusiasm and vigour It soon became apparent that to achieve a 435 bedded District General Hospital together with a 50-bedded Maternity Unit some new build would be required to accommodate certain elements of the hospital

The architects who were commissioned to undertake the Feasibility Study George Trew Dunn and Beckles Willson produced an imaginative scheme to provide new Out patient X Ray Dental Accident and Emergency Patients Administration and Operating Departments in a new structure which would span across the courtyard between the C D link and the E–F link For obvious reasons this was called the Crosslink providing communication routes at both ground and first floor levels

It was not surprising that there were very mixed feelings about a proposal to desecrate the quadrangle or Quarterdeck and even those who were pressing for upgraded hospital facilities had reservations regarding the effect that the new build would have on the architectural contours of 1753

Planning approval was eventually given and the financial sanction granted in Spring 1980 it was the last phase of the original Redevelopment Programme to be approved All future upgrading of existing buildings will now have to be achieved through the Major Maintenance Programme which has engulfed Haslar in a cloud of dust and inconvenience to both patients and staff

Work commenced on the Crosslink site in June 1980 and progressed steadily in an orderly fashion with minimum disruption to hospital life The contractors Marples Ridgeway proved to be most efficient, keeping to a tight schedule and completing as planned in September 1983 Commissioning the building was a mammoth and complex task requiring detailed planning to reduce disruption of clinical activity to a minimum which was achieved due to the stalwart efforts of Lieutenant Commander Ian Latimer

The overall design concept and detailed layout of the Crosslink is quite exceptional and Mr Tony Beckles Willson is to be congratulated. The standard of workmanship and finishes in the building is of a very high order and there can be no doubt that the Crosslink has greatly enhanced the consultative, diagnostic and treatment facilities of the hospital

The building became functional in January 1984 but the Official Opening took place on 19 March when the First Sea Lord and Chief of the Naval Staff Admiral Sir John Fieldhouse undertook the ceremony It was a splendid occasion which took the form of unveiling a commemorative plaque in the Outpatient Department followed by the cutting of a commissioning cake by Lady Fieldhouse Guests were then conducted in groups round the ground floor of the Crosslink which was well organised and very informative On completion of the conducted tour the occasion was celebrated by drinks and a buffet lunch in a marquee on the lawn in front of the Medical Mess This was a truly memorable occasion and I am sure will prove to be a turning point in the history of Haslar and the Royal Medical Service

Unfortunately the opening of the Crosslink served to focus attention on the relationships between the Gosport Peninsula Community the Portsmouth and South East Hampshire District

Health Authority and RN Hospital Haslar. It is vital to the future of the RNMS that a satisfactory working and financial relationship is established between both home Naval Hospitals and their respective District Health Authorities.

So much for the present. As I mentioned in my editorial in the Spring issue of the *Journal* it is the centenary year of both the Medical Assistant Branch and the Queen Alexandra Royal Naval Nursing Service. To help commemorate the latter Mrs Kathleen Harland has kindly written a leading article for this edition of the Journal entitled 'A short history of the QARNNS'. This is a splendid article and I am sure will be of great interest to all our subscribers as it further enhances the history of the Royal Naval Medical Service.

Lady Fieldhouse cuts the commemorative cake on the occasion of the [illegible] of the Cromwell Ward watched by (l to r) Surgeon Captain Drinkwater, Surgeon Vice Admiral [illegible], Admiral Sir John Fieldhouse.

J [illegible] Serv 1984 70 59 65

A short history of Queen Alexandra's Royal Naval Nursing Service

Kathleen M. Harland

FEMALE nurses were present in naval hospitals from their inception when Haslar accepted its first patients in 1753 and Plymouth in 1762 the nursing staff was composed of women usually the widows of seamen or marines These dates do not, however mark the formation of a female nursing staff the term was never used no regulations were issued and no uniform prescribed The local naval surgeon was responsible for the selection of candidates Although high standards were set in theory the nurses for whatever reason—poor pay difficult working conditions, little chosen—bore too close a resemblance in the first hundred years of the existence of naval hospitals to the character of Sarah Gamp so shrewdly drawn by Dickens and earned too great a reputation for drunkenness thieving and immorality In view of such long term unsatisfactory conduct it is not surprising that in 1854 the decision was taken to reinstate an all male nursing service ashore such as there was afloat. Most of the women though not all departed and so it might have remained with little or no plans for a female staff in naval hospitals had not events in the civilian sphere impinged on naval thinking and had not an experiment tried during the Crimean War proved an outstanding success

During the nineteenth century nursing increasingly became a field of work for respectable undistinguished women The trend had begun before the Crimean War of 1854–56 but it was that war which proved the value of female nursing The accomplishments of Florence Nightingale at Scutari attracted the most publicity but at the naval hospital at Therapia a Scottish lady Ellen Mackenzie led a group of nurses who were doing very similar work and her achievements were recognised by the Admiralty Board which expressed its full appreciation of her devoted spirit These nurses were of a different breed altogether to their weaker sisters of earlier times They were well trained real nurses as Mrs Mackenzie termed it After the war the emphasis on training and moral character too was strengthened by the establishment of the Nightingale Training School at St Thomas's in 1860 and by later similar institutions Miss Nightingale could in truth say that in 30 years 1854–84 she had raised nursing from the sink

Fig. 1 [illegible] Mackenzie

This development was of great significance to the naval authorities because it presented them with an

alternative. The rough and ready females of the engineering and the male pensioners who had followed them had both proved inadequate as nurses of the Navy's sick. To the new properly trained nurses of good social standing the solution was to be found. The Medical Director General wrote in 1881 'I see no reason why as highly respectable female Nurses are employed in our Civil Hospitals, our Sailors should any longer be denied the inevitable benefit of good nursing.' This was also the recommendation of the Hoskins Committee which reported in 1883. The Director therefore decided to introduce a limited number of trained Sisters of the position of gentlewomen under the superintendence in each Hospital of a Head Sister. This decision was incorporated into the first section of the *Regulations for the Female Nursing Staff in the Royal Naval Hospitals at Haslar and Plymouth* published in 1884. The Head Sister with her three sisters arrived at Plymouth on 2 October 1884 while the Haslar group of a Head Sister and six sisters assembled from the 4th to the 6th.

The nursing staff thus established was a civilian one for its sisters were not required to join the Navy in the sense of being subject to the Naval Discipline Act. The Regulations however governing their duties and conduct were comprehensive ranging from the detailed—no wine to be taken into the bedrooms—to the general—all appointments were made on the recommendation of the Director General. On the wards the sisters were to give instruction to the attendants of the newly formed Sick Berth Branch in practical nursing duties defined as among other things bandaging, cooking a sick diet—and applying leeches. They also had authority over them and were to report neglect of duty or impropriety of conduct to the Head Sister. Additionally, apart from their normal nursing duties the sisters were to be responsible for the general tidiness of the area and were to accompany the Medical Officer on his rounds. The final regulation presented two sides of the same coin the desire to establish a female nursing staff which would be in contrast to the past both respected and respectable. Thus the sisters were to become officers of the hospitals taking a position immediately after the surgeons and (were) at all times to receive the respect due to gentlewomen. On their part they were asked to combine personal reserve with obedience to the officers and courtesy to the other persons of the establishment. There is a reflection here of the Nightingale philosophy which put such a stress on the importance of personal integrity. The Director General drawing on established civilian and also Army practice had created a nursing service with clearly defined duties and responsibilities, supported by a position of dignity and standing. From the beginning the female nursing staff was given its place in the medical hierarchy of the Royal Navy.

Although the arrival of the sisters had been anticipated with some doubt the judgement of the naval medical men of the time proved to be favourable: one wrote of their professional knowledge and skill being of incalculable benefit, another stated that the mere presence of these ladies exercises a restraining and humanising influence over the patients and thus leads directly to the preservation of order and decency in the wards. Although it was acknowledged that their sex and social standing excluded them from nursing, as it was delicately put, affections of the middle third of the body, the overall feeling among the doctors was one of considerable satisfaction.[5]

The original indoor uniform of navy blue dress and tippet, white collar and apron has remained largely unchanged apart from fluctuations in skirt length according to fashion, though the lacy cap tied under the chin has given way to the handkerchief style veil, and the navy blue straw bonnets for outdoors have been replaced by the tricorn hat. The distinctive cloak, now scarlet lined, is however still worn.

The staff grew gradually but steadily until at the turn of the century it numbered three Head Sisters and 28 sisters. The new Head Sister had been appointed to Chatham Hospital, the smallest of the three home hospitals, in 1887. The first sisters to serve abroad were sent to Malta in 1889 and the first to serve at the Royal Naval College Dartmouth arrived in 1896. The first opportunity for service on a hospital ship came in 1898 with the

[illegible] sisters with the Head Sister [illegible] the centre [illegible] 1897 [illegible] right arm

[illegible] the punitive expedition against the African [illegible] of Benin. Four sisters were nominated to serve on the *Malacca* which dealt with over a thousand cases of malarial fever.

In October 1901 Queen Alexandra, wife of King Edward VII, wrote to the First Lord of the Admiralty, Lord Selborne: 'May I tell you the great wish of my heart has always been to have the Navy Nursing Department under my special charge and that it may likewise bear my name and be amalgamated with the Army if possible.' Lord Selborne replied '... that the whole Medical Department of the Navy and especially the sisters will feel greatly honoured by this expression of Your Majesty's wish.' His enthusiasm was unquestionably shared in naval circles where it was felt that the effect could not fail to be beneficial.

Apart from the honour accorded the naval nursing sisters of having the Queen at their head, the interesting point is her suggestion that they should be amalgamated with their Army colleagues, though by adding 'if possible' the Queen showed her awareness of potential difficulties. A detailed comparison was then carried out of conditions in the two Nursing Services for, whether amalgamation went through or not, the two were sufficiently similar in their work for conditions to be made as equable as possible. One stumbling block on the way to amalgamation was the sisters' liability to serve, defined as naval hospitals at home and abroad and hospital ships. Thus a naval sister could not be called upon to serve in an Army hospital unless the Regulations were changed, which would alter one of the basic conditions of service, something not to be undertaken lightly. It would appear that there was no wish to do this as doubtless the naval authorities desired to retain their own nursing service.

The Regulations published in November 1902 bore the new title *Queen Alexandra's Royal Naval Nursing Service*. While to a considerable extent based on earlier ones, these Regulations contained new clauses, two of which were consequent on the Royal patronage. Queen Alexandra was personally to sign the paper confirming each sister found suitable for appointment in the Service, and to the original red Geneva Cross badge was added, above the Queen's monogram, two As interlocking, an anchor and cable erect, the whole surmounted by a representation of the Imperial Crown. The association of royalty with the Service continues to the present day as Queen Alexandra's great granddaughter, Her Royal Highness Princess Alexandra, was appointed Patron in 1955 in succession to Her Majesty Queen Mary. Another new section in the Regulations required candidates to produce a certificate proving at least three years training in a large civil hospital where male patients were treated in medical and surgical wards. This requirement reflected the increasing standardisation in civilian nursing where shortly before the Royal British Nurses Association had received the right to keep a list of nurses. The Association had intended/wished to maintain a register but this was the compromise reached. The final clause of 1902 was concerned with discipline. It read: 'nothing contained in the foregoing Regulations is to be taken as relieving the Head Sister and Nursing Sisters from being subject to the general control and supervision of the Principal Medical Officer of the Hospital to which they are attached.' This was slightly more specific than what had gone before. It could perhaps be said that the female nursing staff which, through the bestowal of Royal patronage, had grown in stature by the close of 1902, had also been drawn more closely into the world of the Navy which it served. It was the beginning of a process which reached its logical conclusion 75 years later in 1977 when members of the QARNNS became subject to the Naval Discipline Act.

The intake of additional sisters in the early years of this century reflected the Navy's own expansion in what was the era of the *Dreadnought* and also the fact that, approaching its 25th anniversary, the Service was a success.

When two sisters were sent to the naval hospital at Hong Kong in 1902 it was in response to repeated requests for, as the Deputy Inspector General there wrote: 'The benefits of nursing sisters have been so amply proved and the comfort and help they give to patients is so generally recognised that the Royal Naval Hospital here must be considered as behind the times without them.' Additionally it was felt to be particularly appropriate to send female staff to establishments such as the Royal Naval College at Osborne and the Boys' Training Centres at Shotley and Queensferry where cadets and youths were under training. In 1909 the Service numbered three Head Sisters and 55 sisters.

Paradoxically, contentment without was not matched at this time by contentment within. There were 15 resignations between 1908 and 1909. One problem diagnosed by Admiral Durnford's Committee on the Naval Medical Service which reported in 1909 was the lack of promotion prospects. With only three Head Sisters, promotion was bound to be extremely slow and the majority could not hope to rise above the rank in which they had entered. It was felt that the creation of an intermediate rank (between Head Sister and Nursing Sister) would inspire ambition and so increase efficiency by furnishing a prospect of

advancement [1] A substantive rank with the title of Superintending Sister was accordingly introduced Candidates were to be promoted by selection tempered by seniority from the list of nursing sisters Seven posts at this rank were created one each at Haslar Plymouth Chatham Portland Malta Gibraltar and Hong Kong In the home hospitals the Superintending Sisters were expected to act as deputies to the Head Sisters and relieve them of some nursing duties such as attendance at the officers wards thus allowing them to devote more time to administration and general supervision Abroad the senior sister would thereafter be a Superintending Sister

Another problem about which representations were made to Admiral Durnford's committee was the increasing burden borne by sisters in the larger hospitals they were frequently expected to take charge of more wards than was consistent with efficiency and at Plymouth it had been found impossible to carry on the hospital routine satisfactorily without depriving the sisters of the leave to which they were entitled New staffing ratios were therefore worked out resulting in the creation of 11 posts As the Director General was a member of the Durnford Committee he was closely involved both in hearing evidence and in working out solutions

When Britain declared war on Germany on 4 August 1914 the Service numbered three Head Sisters seven Superintending Sisters, 56 sisters and five probationary sisters The size of this nucleus of regular sisters did not greatly change during the war years. The ability of the Service to expand rapidly to meet the new demands placed on it was due to the institution in 1911 of the means to form a Reserve of sisters as recommended by the Desmond Committee by which the Director General negotiated with the main civilian hospitals the numbers they could release in an emergency The wisdom of this far-sighted decision was proved by the speed at which the Service expanded by mid 1914 there were already 102 Reserve sisters a few months later there were 123 in 1915 the number rose to 153 Sisters continued to serve in the same home establishments as before, at Haslar Plymouth Chatham Portland, Osborne and Dartmouth Deal and Shotley and abroad at Malta and Gibraltar though not at Hong Kong from where they returned in 1915 They also nursed in the new hospitals at East Fifton Edinburgh at Granton at Larbert and Peebles

Hospital ships were used extensively during the war and immediately after the Armistice Sisters served on 14 hospital ships for varying lengths of time Their distribution and duties while on board were allocated by the Senior Medical Officer and

Fig. 3 A ward in the First World War hospital ship *HMA Magic*

the day and night routines thus worked out were similar to those of a shore hospital with the difference that the sisters shared the same risks as the men Three sisters were on board the SS *Rohilla* when she foundered in heavy seas in 1914 they were rescued and later congratulated by the Admiralty on their admirable conduct during the shipwreck [2] Another three sisters from the SS *Drina* were not so fortunate being tragically killed in the *Natal* calamity of 1916 [3] Four sisters were members of the medical team on the SS *Plassy* waiting to take off the survivors from the disastrous Gallipoli campaign One later wrote, They all arrived on board in the clothes they had worn for many weeks or months these were usually quite stiff with blood and mud, alive with vermin and almost black with flies" Dressings were done under some difficulty especially in rough weather getting between the cots was a squeeze patients were brought to the operating tables with no previous preparation the task of the solitary Night Sister was not particularly easy yet all were agreed that they had never before nursed men who (had) suffered so much and complained so little [4]

After the Armistice the hospital ships *Garth Castle* and *Berbice* on which sisters were serving were sent to the Baltic ports to repatriate sick prisoners of war from East Prussian camps The *Berbice* was also sent to Scapa Flow to take in and nurse the sick from the surrendered German fleet

Sixteen Royal Red Cross medals were awarded to Regular sisters Much excellent work had been done in an unassuming way and the Service could undoubtedly look back on its response to the first major crisis in which it was involved with great satisfaction

During the later war years numbers rose from

72 in 1919 to 82 in 1938. There was never any difficulty in maintaining the desired establishment. If however there was no great alteration in overall numbers there was certainly a re-arrangement of the structure of the Service. Additional Head Sisters were created at the hospital in Malta in 1926 and at Melville Hospital Chatham in 1935. The rank of Head Sister in Chief was introduced in 1927 because of the necessity for one Head Sister to assume responsibility for the general administrative duties of the Service. These included the inspection of the nursing organisation of the home hospitals and establishments and exercising a general supervision of resignations and retirements. To distinguish long serving sisters from junior ones the grade of Senior Sister was introduced in 1936. It came into force after 16 years service and had its own distinguishing uniform marks. At this period too the method of selecting candidates for entry came under discussion at the instigation of the civilian members of the QARNNS Consultative Board which met regularly at this time. They would have liked more say in the selection procedure but eventually it was left as before chiefly in the hands of the Deputy Medical Director General and the Head Sister-in-Chief or Matron-in-Chief as she was titled from 1935 onwards. Shortly before the outbreak of war the QARRNS Reserve was reorganised in favour of a system of direct entry. The number required initially was about 400.

By late 1939 numbers had risen to 193 and finally reached approximately 1300. Sisters served in the existing naval hospitals, in six auxiliary hospitals and in the sick quarters of any establishment where WRNS were serving or training, both at home and abroad. Often, as in the hospitals of the

Fig. 4. Nurses at RNH Bighi 1931. They are wearing the old style tropical uniform of long sleeved blouse, skirt and apron, and the Superintending Sister has a broad band on her tippet.

southern ports, they had to work under the pressure of constant air raids which became much more frequent after Dunkirk. Patients were moved as quickly as possible to auxiliary hospitals inland. Abroad sisters were present during the bombardment of Malta and at the capture of Hong Kong by the Japanese in 1941, by whom they were interned for the remainder of the war. They served at the base hospital in Alexandria which initially bore the brunt of the casualties from Field Marshal Montgomery's Eighth Army offensive. This was an Army hospital with a number of naval personnel so there had to be some adaptation to Army methods. The Combined Services Hospital at Trincomalee was another example of Army and Navy medical staff making every effort to work in harmony. Sisters who served in such hospitals had an opportunity not possible in peacetime, undoubtedly gained in experience.

As in the First World War sisters worked with the medical officers and sick berth attendants in hospital ships in which conditions naturally varied, although equipment and accommodation seem always to have been good. The weather was less predictable: sisters might have to adapt to the humidity of Freetown harbour or to the storms of Scapa Flow. The type of nursing depended to some extent on the theatre of war in which the hospital ship served. In the North Atlantic for example burns and shrapnel wounds predominated. Although the work was undoubtedly hard and when patients were being brought on board the hours long, there was always this ready willingness to make the best of whatever was the current situation. Entertainment was sometimes professional with visits from the ENSA team, sometimes homemade—musical evenings or cocktail parties. Sisters serving in ships stationed abroad enjoyed unstinting hospitality from local families.

For a short time in 1945 several sisters took to the air acting as flight nurses during the evacuation of naval casualties from the Admiralty Islands to the Royal Naval Auxiliary Hospital at Sydney. Once again, adaptability was an absolute necessity as air evacuation was not common in the naval world and with psychiatric or hysterical patients presented its own problems.[14]

At the end of the war three aircraft carriers were converted to medical use for the repatriation of former prisoners of war from the Philippines to Canada via Pearl Harbour and Hong Kong. The main groups of diseases encountered by the medical team were tuberculosis, beriberi and a number of pyrexial illnesses of the typhoid group. Nursing former prisoners of war required a great amount of sensitivity; the reception that greeted the ships on

... all with experience for the sisters on board.

The standard of nursing during the first part of the war was well up to that of pre-war times. Sisters who joined the Service at the onset of hostilities, though of all ages and of varying experience, were all well trained experienced nurses. The vast majority were keen, interested in learning Service routine and accepted with good spirit the difficult conditions then prevalent. As the war progressed however training was disrupted, patients were quadrupling at an alarming rate and the Regular sisters, familiar with naval routine, were scattered world wide. Undoubtedly these factors made it more difficult to maintain standards but maintained they were. Naval sisters established a high level of professional competence in a spirit of resolution. Eight members died on active service and 110 decorations were awarded.[7]

In 1949 on the formation of the Medical Branch of the Women's Royal Naval Service, Wren Sick Berth Attendants were trained and worked alongside the male branch established in 1884. VADs still remaining in the Navy were given the option of retaining their separate identity or joining the newly formed WRNS branch which continued until 1960 when it was replaced, along with the remaining VADs, by new QARNNS ratings. The QARNNS therefore became a two-tier Service, sisters selected from applicants who were State Registered Nurses and nurses under training for State Registration or State Enrolment. The assumption of the role of training candidates within the Service was a major change—hitherto sisters had entered already qualified—and also a demanding responsibility as the claims of establishments and Service movements generally had to be weighed against the need to provide a continuous and balanced training. However the need to give all entries a controlled and statutory training and qualification was recognised. After application to the General Nursing Council for England and Wales and after meeting certain criteria laid down by that body permission was given for SRN and SEN training to take place. As early as 1948 Sister Tutors now Nurse Tutors had begun studying at London University with a view to organising the instruction programme based on the syllabus laid down by the General Nursing Council. Classes were divided between RNH Haslar and RNH Plymouth. Naval nursing became popular and in the early 1970s there was a minimum two year waiting list. Nursing ratings now join the Navy at HMS *Raleigh* and continue professional training at the Portsmouth District and Royal Naval School of Nursing.

A non-nursing section known as the Clerical and Quarters Category was introduced to the QARNNS in 1974 its purpose being to provide officers and ratings to manage QARNNS quarters and undertake admin-station tasks in Royal Naval hospitals at home and abroad.

In 1977 QARNNS personnel became subject to the Naval Discipline Act, commissions being granted to Nursing Officers. From April 1982 the Service became a unified one when for the first time men were given the opportunity to join. The reason behind the change was to correct the irregularities in the terms and conditions of service of people holding similar qualifications. Medical Technicians and Assistants developed from the original Sick Berth Attendants could transfer from their branches of the Royal Navy. Additionally men holding State Registration became eligible to apply for Short Service Commissions. The all female Naval Nursing Service was just two years short of its century.

Like any other branch of the Services the QARNNS had to react swiftly to the crisis over the Falkland Islands. The SS *Uganda* was the hospital ship for the three Services during the conflict in 1982. Its complement consisted of 15 QARNNS female officers, 26 QARNNS female ratings (at this time the integration of men into the Service had not been effected), 23 medical assistants and technicians and 10 medical officers. SS *Uganda* was the first British hospital ship since HMHS *Maine* which saw service in the Korean War of 1950–53. At very short notice, and with only three days of intensive training concentrating on burns, gunshot wounds and trauma, the team flew to Gibraltar where they boarded SS *Uganda* for the voyage south. As they went, the hospital was unpacked from its crates and public rooms were transformed to accommodate an operating theatre, pathology laboratory, wards, burns and intensive care units. During the two months the ship spent in the war zone its medical team treated 730 casualties including 150 Argentine prisoners. More than 500 operations were performed despite adverse weather conditions. Many of the wounds and burns were horrific and not commonly seen in peace time hospitals. Moreover the wounded could and did arrive at an alarmingly swift rate, particularly after the bombing of HMS *Plymouth*, HMS *Sheffield*, RFA *Sir Galahad* and the battle of Goose Green. In such circumstances nursing resources were stunned to their maximum but all members of the QARNNS responded with instinctive courage and resolution.

Today members of the Service continue their responsibility as part of the medical team for the health and fitness of all who belong to the Royal

Navy the Royal Marines and the Women's Royal Naval Service at the sick bays and medical centres of naval establishments throughout the country and abroad at Hong Kong, Gibraltar and Lisbon. The Royal Naval Hospitals at Haslar and Stonehouse are still the focal points of naval medicine where dockyard employees and civilians from the surrounding areas also receive treatment.

Those who have served in Queen Alexandra's Royal Naval Nursing Service have exhibited the personal qualities necessary for good nursing, still the same today as they were one hundred years ago and have exercised professional capabilities reflecting the standard of medicine and training of their time. It is the combination of these two factors which has given the QARNNS the valued place it holds in the Royal Navy.

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Recent experience with carbon fibre

A. H. Osborne, R. C. Telfer and M. A. Farquharson-Roberts

Summary

The recent advances in ligament reconstruction using carbon fibre in the knee joint are discussed. A series of ten patients treated with carbon fibre are presented.

INTRODUCTION

Carbon fibre was originally developed for the aerospace industry some 20 years ago because of its strength and stiffness ratios to density when compared to the metals and alloys available at that time.

The scope of application then broadened into sports and leisure equipment, eg. fishing rods, tennis racquets and ski sticks. It became possible to manufacture a constant filamentous carbon fibre of high purity to act as a ligament prosthesis. Courtaulds produced a fibre with carbon fibrils linked in an orderly manner to give strength and flexibility in the form of a twisted cord-like structure which circumvented the brittleness of individual fibres.

DEVELOPMENT

Jenkins[1] in 1977 demonstrated that pure carbon in a flexible and filamentous form of great strength could be used to successfully induce the formation of new tendons in rabbits and sheep. Histological evidence suggested that the new tendon was actually induced in form by the presence of the carbon. The implant apparently acted as a natural scaffold while new tendon developed which was of a similar size and strength to that of a normal one.

By 1980 Jenkins and McKibbin had implanted carbon into 102 patients and published their results on the first 60 patients. Forty-seven had undergone knee ligament repair and of these 31 had been combined ligamentous procedures. Five had had lateral ligament reconstruction for pronedures of the ankle although two of these had subsequently to be removed for sinus formation.

There were surprisingly few complications. In a few repairs of the knee pain and tenderness over prominent subcutaneous knots responded well to removal of the projections. No mechanical failure of the implant was identified.

Demonstrable instability persisted in some knees but this was suspected to be a secondary fault caused by physiotherapy or inadequate positioning of the implant. No evidence of lymph node enlargement was found. Carbon fibre fragments had been found in the regional lymph nodes of sheep at 12 months and had been a cause of initial concern in its application to human implantation.

Jenkins and McKibbin felt that these initial good results justified the continued use of such implants in ligament repairs. It was felt that implants should be confined to severe cases of disabling instability.

Carbon fibre was marketed on a general scale in this country in the early 1980s. The importance of correct operative technique was stressed and many implants were carried out by orthopaedic surgeons. Knee instability had been a major problem and the active and passive knee-stabilising procedures then in use were of limited success in the Grade IV unstable knee. Early results were not good in many centres and the insertion procedures pioneered by Jenkins were not easily reproduced.

ROYAL NAVY USE

Carbon fibre implantation was carried out in a series of ten patients at the Royal Naval Hospital, Haslar (*Table I*). All underwent surgery between 1980 and 1983. Nine were due to be invalided from

Table 1 Type of implant number of patients and general [illegible]

Implants	*Patients*	*Comments*
Posterior cruciate ligament	2	Further RTA [illegible] ng re-implantation Eventually P2 One eventually invalided with ankling
Anterior and posterior cruciate ligaments	1	Regained P2 Category
Anterior cruciate and medial ligaments	4	One invalided after carbon fibre rejection
Anterior cruciate and lateral ligament	1	Regained P2 Category
Medial ligament	1	Invalided after loosening with carbon fixation plates
Antero-lateral ankle stabilising procedure	1	Carbon fibre reject on but regained P2 Category after further surgery

the Royal Navy for Grade IV* gross instability of the knee and were keen to remain in the Service This tenth was a case of ankle instability

The first two patients suffered posterior cruciate ligament instability (*Fig 1*) Their symptoms were

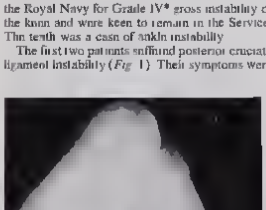

Fig 1 Patient with posterior drawer sign due to [illegible] or cruciate ligament rupture

so severe that they were unable even to walk downstairs without a sense of the affected knee giving way These implants were the most difficult to perform technically but also the most successful in relieving symptoms One of these patients was involved in a road traffic accident 13 months after implantation sustaining a further rupture to his posterior cruciate A further exploration carried out three months after his accident revealed the implant to be torn close to the distal insertion The implant was covered by a thin fibrous sheath and histology confirmed no induction of a new ligament within the carbon matrix The patient at 13 months post operation had been relying entirely on the strength of the implanted carbon fibre ligament A new carbon fibre implant was inserted and he regained a P2 category four months later

A further combined medial and anterior cruciate ligament implant produced skin breakdown over the knee used to hold the implant, although this was deep to muscle A series of sterile skin ulcers over the deep course of the carbon fibre occurred These ulcers contained fibrils of carbon fibre and arthroscopy revealed the presence of similar fibrils in adjacent areas of synovium All carbon fibre was eventually removed at seven months after insertion

Again no evidence of new ligamentous material was found in the anterior cruciate implant although it was covered by a thin fibrous sheath The medial ligament was surrounded by a thick fibrous sheath but with no induced new ligament formation in the carbon matrix on histological examination Significantly this patient's antero-medial instability had been corrected by the implant and his symptoms recurred with its removal

Another patient with an initially excellent medial ligament implant developed further laxity over the second three months and eventually had to be submitted for invaliding.

The only attempt at lateral ligament reconstruction of the ankle followed an Evans Inodesis which had been ruptured by a fall soon after removal of plaster The reconstruction with carbon fibre was technically sound but wound breakdown occurred over a superficial portion of the implant and discharged carbon fibrils which persisted until the

* Note Measurement of instability Grade I instability of 5 mm or less. Grade II between 5 and 10 mm Grade III between 10 and 15 mm. Grade IV over 15 mm

implant was removed The patient regained a P2 category after further surgery

The remaining six patients made satisfactory recoveries taking up to six months to reach a P2 category One was to be surveyed later at 18 months after spending ten months in a small ship where the constant rolling caused aching in the area of the posterior cruciate implant rather than instability Table I reveals an approximately 60% success rate in a series which without surgery would have resulted in a 100% loss to the Service

By May 1983 Rushton Dandy and Naylor[4] had been able to review 39 anterior cruciate ligament repairs using carbon fibre combined with a Mcintosh procedure Arthroscopic examination with biopsy at a mean of 16 9 months after repair revealed that the carbon fibre had not induced the formation of a new ligament and the repair was merely covered by a thin fibrous sheath. Histological investigations confirmed this with only a suggestion of a fibroblastic response to carbon fibre found in five patients Particles of carbon fibre were scattered throughout the knees Synovitis and breakdown of skin over subcutaneous carbon fibre complicated treatment. Failure of carbon fibre to bond to bone was detected radiologically This was also the case in other centres and confirmed our own earlier experience in this field

Doubt was being expressed in many quarters as to the power of filamentous carbon implants to attract connective tissue ingrowth and lay down strong collagenous fibres[4] although none doubted its efficacy in the original sheep pilot studies The majority of surgeons now use anterior cruciate ligament fibre implants only if these are surrounded either by the original cruciate remnants adjacent fat pad or a transplanted fascia lata sheath

FIXATION OF CARBON FIBRE IMPLANT

Initial fixation of the implant was by a loose knot at one end of the implant but this was bulky and often the site of discharge Methyl methylic bone cement was later utilised— a small anchor being fed around the end of the carbon strand and recessed into the bony insertion Carbon fibre (*Fig* 2) was pulled through drilled holes using a tonsillar snare (*Fig* 3) The holes were sited using a drill guide (*Fig* 4)

Carbon fibre ligament fixation plates were later used after production in Germany in an attempt to improve fixation These proved successful initially but later resulted in gradual loosening of the carbon fibre at six months and recurrence of instability These were used in a Royal Naval case of gross medial ligament instability whose initial good

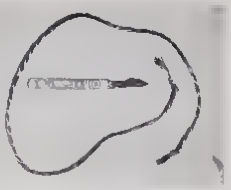

Fig 2 Carbon fibre as used for ligament implantation

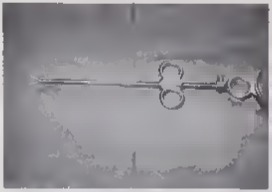

Fig 3 Tonsillar snare

Fig 4 Drill guide

results were not maintained It might be argued however that by six months natural collagen fibre invasion at the insertion points should have made the plates superfluous

Fixation has lately been improved by Strover who has performed many carbon fibre implants in South Africa. He has developed a bollard and

toggle system of anchorage manufactured of carbon fibre and polysulphone composite. It allows for the better tension of the carbon fibre tow.

Carbon fibre filaments are now being coated in an absorbable material that maintains its integrity long enough to allow for insertion but not long enough to prevent ingrowth by surrounding collagen. This prevents the breakdown of carbon fibres during handling and prevents migration of such fibres from the site of surgery and consequent wound breakdown.

Tissue adhesive is now used in many centres as a form of fixation to allow satisfactory and appropriate tension when inserting the implant. Histoacryl is a n-butyl ester of the a cyanoacrylate series which polymerises in the presence of tissue moisture and acts as such an adhesive.

CONCLUSION

The opportunity to correct gross knee instability especially that due to a deficient anterior cruciate ligament, using an implant which acted as a framework for collagen invasion led to enthusiastic initial use. Experience has tempered this early enthusiasm and its use is now more restricted.

However it has redoubled the search for a prosthetic implant durable enough to give main-taining stability. This has led to the increased availability of inert materials such as Dacron knee reconstruction grafts, the Leeds Keio anterior cruciate ligament of open weave Terylene fabric and the Goretex expanded polytetrafluoroethylene (PTFE) prosthetic anterior cruciate ligament. Their effectiveness is currently being evaluated by Royal Naval orthopaedic surgeons.

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Studies on the cimetidine resistant duodenal ulcer: A summary of work performed at the Royal Naval Hospital, Haslar*

T. Gledhill, Jane Mills, W. L. Burland and R. H. Hunt

INTRODUCTION

Cimetidine does not heal all duodenal ulcers. After four to six weeks treatment with cimetidine 800 mg to 1.6 g/day endoscopically confirmed healing is reported in around 75% of patients.[1] Continued treatment increases the number of ulcers healed and only a small proportion will remain unhealed after 8–12 weeks therapy. In addition to those showing a relative resistance to treatment with cimetidine there are also patients whose ulcers recur in spite of maintenance therapy at doses sufficient to maintain the majority of patients symptom and ulcer free.

Few studies have investigated these patients systematically in order to elucidate possible distinguishing features. Although some authors have suggested that basal acid output before treatment is higher in patients whose ulcers do not heal after short course of cimetidine these findings have not been confirmed and similarly no significant differences in endoscopic features, pepsin output and serum gastrin concentration have been reported in these patients compared to those whose ulcers heal.

Analysis of data generated during studies to investigate the effects of various H_2 receptor antagonists on intragastric acidity suggest that nocturnal acid output may be of particular importance in the development and maintenance of duodenal ulceration and it is during this time that H_2 receptor antagonists exert their most important effects.[2] This idea is not new. Dragstedt first suggested that nocturnal secretion was the single most important aetiological factor in 1945 but he proposed that this was a manifestation of increased vagal drive.

Pepsin is another important aetiological factor in the pathogenesis of duodenal ulcer and a relative hypersecretion of pepsin in patients with duodenal ulcer has been reported.[3] Vagal stimulation is a potent stimulus for gastric pepsin secretion which may explain why reported healing rates of duodenal ulcer following surgery are higher than those reported following treatment with H_2 receptor antagonists.[4]

Different patterns of overnight response to cimetidine have been noted with some patients showing a relatively small decrease in hydrogen ion activity and retrospective analysis suggested that these patients had a poor clinical response to treatment.[5] The results of other studies have lent some support to the hypothesis that patients who respond poorly to treatment with an H_2 receptor antagonist have an increased vagal drive. Many of these patients subsequently respond well to vagotomy.[6]

The present studies were designed to investigate nonresponders to cimetidine in more detail in particular to investigate nocturnal acid and pepsin output and the response to a variety of drug regimens.

SUBJECTS

Healthy male subjects and duodenal ulcer patients were studied. Patients were classified as non

* Submitted to Edinburgh University for Chevalier's

responders responders or were unclassified All patients were studied on at least two occasions but no more than four separate occasions Non responders were defined as follows

1 Failure of the ulcer to heal after cimetidine 1 0 g/day for six weeks

2 Endoscopic and symptomatic relapse on maintenance therapy of 400 mg nocte

3 Endoscopic and symptomatic relapse within one month of stopping cimetidine 1 g/day for six weeks

METHODS

Twenty-four hour monitoring of intragastric pH

Following an overnight fast a nasogastric tube (10 French Salem sump) was passed and the position checked by water aspiration Samples of gastric juice were aspirated hourly and the pH measured using a combined glass and reference electrode An identical diet was given on each study day and was estimated to contain approximately 2960 calories 144 g of protein 143 g of fat and 240 g of carbohydrate The number of cigarettes and alcoholic drinks were recorded on a data sheet and the pattern repeated on subsequent occasions by reference to the records

At 0100 the stomach was emptied by manual suction and continuous mechanical aspiration at −50 mmHg applied overnight Mechanical suction was interrupted by supplemental manual aspiration every 20 minutes and a small quantity of air blown down the tube to ensure patency Gastric juice was collected in hourly aliquots the volume recorded and acid concentration determined by titration to pH 7 0 with 0·1 M sodium hydroxide

During continuous collections samples of gastric juice were also taken and immediately frozen at −20 C for later storage at −90 C following which peptic activity was estimated by the method of Gray and Billings [8]

In some studies the nasogastric tube was not passed until 1500 with data being collected during the evening and overnight. In most studies a 19 gauge butterfly cannula was inserted into a forearm vein and kept patent with heparinised saline Blood samples were collected at intervals overnight for the assay of plasma cimetidine and serum gastrin

Impromidine (H receptor agonist) stimulation of gastric acid output

Preliminary results from the above studies suggested that impromidine may have increased intragastric pepsin secretion. This finding was contrary to our expectations. It was therefore decided to examine pepsin secretion in response to H agonism in a group of healthy volunteers Gastric juice was collected every ten minutes throughout this study and acid and pepsin output calculated as in other studies Basal output was

H⁺ activity in Duodenal Ulcer Cimetidine Nonresponders

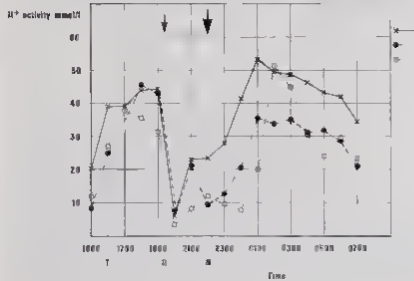


Fig 1 Mean hourly hydrogen ion activity in 12 nonresponders receiving either no treatment (placebo) cimetidine 1 g/day or cimetidine 2 g/day

determined ... 90 ... then pentagastrin 10 μg/kg/h was then given by constant intravenous infusion for another 90 minutes. Peak acid and pepsin outputs were calculated from the sum of the last six 10 minute collections.

STATISTICAL ANALYSIS

All pH measurements were converted to hydrogen ion activity (mmol/l) and data stored on a Hewlett Packard System 45 desk top computer. Students paired t test was used to compare data in the same patients receiving different treatments and unpaired t tests to compare results between different groups of patients.

RESULTS

a. The effect of cimetidine 1·0 or 2·0 g/day on mean hourly hydrogen ion activity and nocturnal acid output

In this study cimetidine was administered three times a day after meals (200 or 400 mg) and at 2200 (400 or 800 mg).

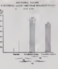
The mean hourly hydrogen ion activities obtained in 12 nonresponders are shown in *Fig 1*. Mean hourly nocturnal (0100–0700) hydrogen ion activity was reduced from 45 mmol/l during no treatment to 33 mmol/l and 31 mmol/l following treatment with cimetidine 1 and 2 g respectively. There was no significant difference between the effects of the two doses.

The volume of gastric juice overnight was reduced from a mean of 81 ml/h on no treatment to 64 ml/h and 54 ml/h on the cimetidine study days (*Fig 2*). Similarly doubling the dose of cimetidine failed to produce a significant increase in the degree of inhibition of mean nocturnal acid output which was reduced by 41% following cimetidine 1·0 g/day and 51% by cimetidine 2·0 g/day (*Fig 2*).

Mean serum cimetidine concentrations are shown in *Fig 3*. Doubling the dose of cimetidine produced an appropriate increase in circulating drug concentrations.

b. Comparison of the effects of no treatment with cimetidine 1·0 g/day in nonresponders and unselected duodenal ulcer patients

In addition to the 12 patients studied using the two dose regimens of cimetidine another 13 non responders were studied on two separate occasions once during no treatment and once during the administration of cimetidine 1·0 g/day. Results from the two series have been combined and compared with those obtained in 25 unselected duodenal ulcer patients who had been studied



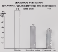


Fig 2. Mean nocturnal volume of secretion in 12 nonresponders receiving either no treatment (placebo) cimetidine 1 g/day or cimetidine 2 g/day (top) and Mean nocturnal acid output in 12 nonresponders receiving either no treatment (placebo) cimetidine 1 g/day or cimetidine 2 g/day (below).

previously at the Royal Naval Hospital Haslar using an identical 24 h protocol.

Mean hourly nocturnal hydrogen ion activity is shown in *Table I*. On the no treatment study day there was no significant difference between the two groups (49 and 48 mmol/l). However the response to cimetidine was greater in the unselected duodenal ulcer group: mean hourly hydrogen ion activity fell to 12 mmol/l (ie by 75·5%) compared to 33 mmol/l (31·3%) in the nonresponders ($p < 0·01$).

Volume of secretion (*Table I*) was reduced from 55 ml/h to 29 ml/h (47·2%) in the unselected duodenal ulcer patients ($p < 0·01$) but in the nonresponders a reduction of 74 to 56 ml/h (24·3%) was not statistically significant.

There was no significant difference in mean nocturnal acid output between the two groups when

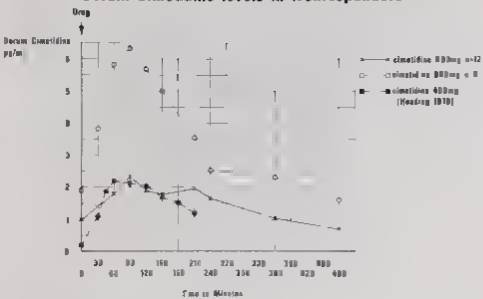


Fig 3 Serum cimetidine levels in 12 nonresponders receiving a 400 mg nocte dose of cimetidine in 4 nonresponders receiving an 800 mg nocte dose of cimetidine and in a previous study of nine healthy subjects (46) receiving a 400 mg nocte dose of cimetidine

Table 1 Mean nocturnal hydrogen ion activity volume of secretion and acid output in 25 nonresponders and 25 unselected duodenal ulcer patients receiving either no treatment or cimetidine 1 g/day

	Nonresponders		*Unselected*	
	Placebo	*Cimetidine*	*Placebo*	*Cimetidine*
24 h H^+ (mmol/l)	49	33	48	12
Volume (ml/h)	74	56	55	29
Acid (mmol/h)	6 6	3 5	4 3	0 7

ou no treatment. Acid output was reduced from 6 6 to 3 5 mmol/h in the nonresponders and from 4 3 to 0 68 mmol/h in the unselected duodenal ulcer patients following treatment with cimetidine

Mean fasting serum gastrin measured in 13 nonresponders was 58 2 pg/l normal range 30–60 pg/l Four patients had mildly elevated values (73 to 94 pg/l)

c. *The effect of cimetidine 1 0 g/day with or without atropine 2 4 mg/day*

Mean results from 11 nonresponders are shown in Figs 4 5 and 6 there was no significant difference in nocturnal hydrogen ion activity volume of secretion or acid output between treatment with cimetidine alone or in combination with atropine 2 4 mg/day

d. *The effect of proximal gastric vagotomy (Table II)*

Ten patients were studied in this group Insulin tests were used to confirm a complete vagotomy and all patients were graded Visik 1 or 2 Six months after operation there was a highly significant reduction in nocturnal hydrogen ion activity and gastric juice volume Mean acid output overnight decreased from 3 29 mmol/h on no treatment to 1 59 mmol/h during treatment with cimetidine and to 0 95 mmol/h after surgery ($p < 0 05$ compared

H^+ activity in Duodenal Ulcer after Cimetidine 1g and Atropine 2.4mg/day

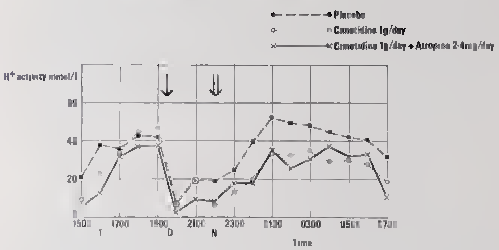


Fig 4 Mean nocturnal hydrogen ion activity in 11 nonresponders receiving either no treatment (placebo) cimetidine 1 g/day or cimetidine 1 g/day combined with atropine 2·4 mg/day

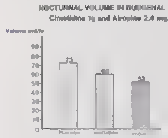


Fig 5 Mean nocturnal volume of secretion in 11 nonresponders receiving either no treatment (placebo), cimetidine 1 g/day or cimetidine 1 g/day combined with atropine 2·4 mg/day

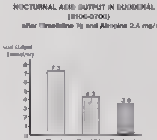


Fig 6 Mean nocturnal (0100–0700) acid output in 11 nonresponders receiving either no treatment (placebo) cimetidine 1 g/day or cimetidine 1 g/day combined with atropine 2·4 mg/day

Table II Mean nocturnal hydrogen ion activity volume of secretion and acid output in 10 nonresponders receiving either no treatment, cimetidine 1 g/day or no treatment 6 months after proximal gastric vagotomy (Standard Deviations in brackets)

	Placebo	*Cimetidine*	*PGV*
24 h H (n mol/l)	41·1 (23·2)	27·3 (35·4)	14·5 (17·9)
Volume (ml/h)	48·6 (37·0)	42·2 (25·9)	17·6 (17·5)
Acid (mmol/h)	3·3 (3·1)	1·9 (2·1)	0·9 (1·2)

with cimetidine) As in the previous studies cimetidine failed to produce a significant reduction in volume of gastric juice collected overnight whilst this was achieved by vagotomy the reductions in mean hourly volume being 0 13% and 59 6% respectively

e The effect of cimetidine on nocturnal pepsin output

Mean nocturnal acid and pepsin outputs were measured in 18 duodenal ulcer patients six of whom were classified as responders and 12 as nonresponders Mean nocturnal pepsin output increased from 1 55 (SD 2 74) IU h on placebo treatment to 3 88 (SD 5 47) IU/h on cimetidine whilst mean acid output decreased from 5 64 (SD 4 5) mmol/h to 3 71 (SD 3 3) mmol/h

The results were also analysed for the non responders and responders (*Table III*) Pepsin output was higher in the nonresponder group on both study days and was significantly higher when patients received cimetidine There was no correlation between acid and pepsin outputs on the no treatment study day but during treatment with cimetidine a correlation was demonstrated $r = 0 64$ ($p < 0 0001$) This correlation is illustrated in *Fig* 7

Table III Mean nocturnal acid and pepsin outputs in 6 responders and 12 nonresponders receiving either no treatment or cimetidine

	Responders		*Nonresponders*	
	Placebo	*Cimetidine*	*Placebo*	*Cimetidine*
24 h H^+ (mmol/l)	34 0 (6 5)	22 2 (6 5)	46 6 (19 7)	27 4 (12 3)
Volume (ml/h)	58 (27)	55 (25)	84 (44)	57 (37)
Acid (mmol/h)	5 1 (2 9)	1 2 (0 3)	5 9 (5 1)	3 8 (3 8)
Pepsin (IU/h)	0 4 (0 2)	2 8 (1 6)	2 1 (3 2)	4 8 (5 1)

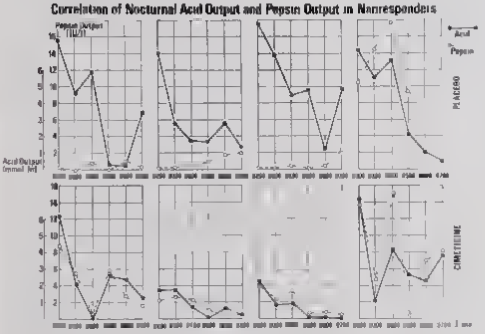


Fig 7 Nocturnal (0100–0700) acid and pepsin outputs in 4 individual nonresponders receiving either no treatment (placebo—top four graphs) or cimetidine 1 g/day

b. The effect of ranitidine on [illegible] cimetidine 400 mg, but [illegible] of 150 mg bd on pepsin output

Mean results obtained in six non-responders are shown in *Figs* 8–10. As in previous studies cimetidine failed to produce a significant decrease in volume. Mean hourly volume was lower on the ranitidine treatment day but this difference failed to reach statistical significance.

The reduction in mean hourly hydrogen ion activity was comparable following ranitidine 150 mg bd or cimetidine 400 mg bd (47·9% and 44·8% respectively) but mean acid output was reduced to a greater extent during treatment with ranitidine 150 mg bd (67·8% compared with 27·0%).

Mean nocturnal pepsin output was increased by ranitidine ($3·12 < SD\ 2·1 > IU/h$) and cimetidine ($2·9 < SD\ 3·2 > IU/h$) compared to an output of

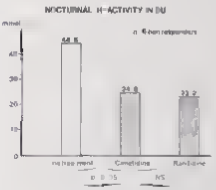


Fig. 8. Mean nocturnal (0100–0700) hydrogen ion activity in 6 non-responders receiving either no treatment, cimetidine or ranitidine.

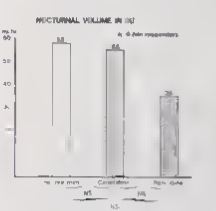


Fig. 9. Mean nocturnal (0100–0700) volume of secretion in 6 non-responders receiving either no treatment, cimetidine or ranitidine.

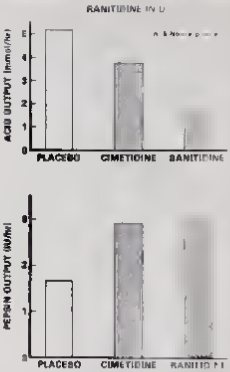


Fig. 10. Mean nocturnal (0100–0700) acid output in 6 non-responders receiving either no treatment, cimetidine or ranitidine.

$1·6 < SD\ 1·9 > IU/h$ with no treatment (placebo).

c. Impromidine in healthy subjects

During the infusion of impromidine 10 μg/kg/h mean gastric acid output increased from 4·11 to 29·7 mmol/h. Mean basal pepsin output was 3·65 (SD 3·63) IU/h which decreased to 0·21 (SD 0·18) IU/h ($p < 0·02$. *Fig.* 11). A decrease in pepsin output was noted in every subject.

d. The effect of cimetidine alone and in combination with atropine 4·8 mg/day

The mean results obtained in seven non-responders are shown in *Table II*. Treatment with cimetidine 1·0 mg/day led to a reduction in mean hourly volumes of gastric juice from 80·5 to 55·7 ml/h overnight whilst combination of cimetidine and atropine reduced mean volume to 16·5 ml/h.

Mean nocturnal acid output was reduced by 83% and 43·5% following treatment with the combination and cimetidine alone respectively.

Nocturnal pepsin output increased during treatment by cimetidine alone but was significantly

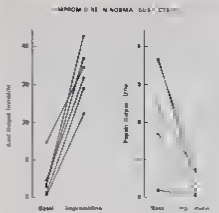


Fig. 11 Acid and pepsin outputs in 6 healthy subjects during a basal hour and after receiving impromidine (a specific H_2 receptor agonist)

reduced when atropine was added to cimetidine All patients receiving this dose of atropine complained of unpleasant side effects of dry mouth and blurred vision

DISCUSSION

Many factors may influence duodenal ulcer healing, including age smoking and drinking habits duration of disease and gastric acid secretion However although in a few studies an attempt has been made to differentiate patients whose ulcers failed to heal during treatment with cimetidine from the rest of the population there is little convincing evidence of a difference Basal acid output has been reported to be higher in some studies[11] but not in others[1 4]

Kirkpatrick and Hirschowitz reported a high residual volume in nonresponders and suggested this could be related to delayed gastric emptying and Rohner *et al*[3] have emphasised the influence of smoking on a patient's nonresponse to cimetidine or oxmetidine In all these studies the definition of non response is failure of an ulcer to heal after four weeks treatment and this is almost certainly an insufficient criterion

ACID SECRETION AND THE VAGUS

The hypothesis that increased vagal drive results in an inadequate response to cimetidine has been put forward on several occasions but never systematically evaluated Some support for the hypothesis exists the fact that patients who fail to respond to cimetidine may do well after vagotomy and the finding that it is possible to discriminate between responders and nonresponders to cimetidine on the basis of failure to inhibit insulin stimulated acid output in nonresponders [5] The present studies were designed to study nonresponders and to investigate this hypothesis in more detail

Comparison of data obtained in 25 non responders and 25 unselected patients with duodenal ulcer (ie. those in whom response to cimetidine is not recorded) showed no difference between them with reference to mean nocturnal hydrogen ion activity and whilst mean nocturnal volume and acid output were higher in the non responders these differences failed to reach statistical significance. However there was a marked difference between the two groups with respect to their pharmacological response to cimetidine. In the responders cimetidine 1 g/day reduced mean nocturnal acid output by 84% compared to only 47% in the nonresponders This was the result of a greater reduction in volume and hydrogen ion activity in the unselected group The reduction in volume of the overnight gastric juice produced by cimetidine in the nonresponders did not reach statistical significance Similarly following treatment with ranitidine 150 mg bd the reduction in volume although greater than that observed during treatment with cimetidine 400 mg bd was only 39 7% and was not statistically significant

Studies in man have demonstrated a correlation between response to cimetidine—in terms of percentage inhibition of stimulated gastric acid

Table IV Mean 24 h hydrogen ion activity nocturnal volume of secretion and nocturnal acid and pepsin outputs in 7 nonresponders receiving either placebo cimetidine or cimetidine combined with atropine 4 8 mg/day (Standard Deviations in brackets)

	Placebo	*Cimetidine*	*Combination*
24 h H (mmol/l)	34 5 (6 1)	23 8 (7 5)	3 5 (3 0)
Volume (ml/h)	78 (26)	56 (23)	17 (13)
Acid (mmol/h)	6 3 (3 9)	3 3 (1 9)	1 3 (1 3)
Pepsin (IU/h)	3 1 (4 2)	3 8 (3 6)	1 0 (1 1)

output—and plasma concentrations of the drug.[16, 19] There is however considerable variation in individual sensitivity to the drug. Studies of overnight intragastric pH have also demonstrated dose response relationships when different doses are given. Increasing the dose of cimetidine from 1 g/day to 2 g/day produced little additional reduction in nocturnal volume or hydrogen ion activity of the gastric juice in spite of achieving antiimpated higher plasma concentrations with the higher dose. These results suggest the presence of some stimulus to volume and acidity of gastric secretion either resistant to or incompletely inhibited by histamine H_2 receptor blockade.

Several studies have shown that the addition of an anticholinergic agent to a single dose of an H_2 receptor antagonist produced an inhibition of nocturnal or stimulated acid output that was greater than that to either of the individual drugs alone.[17, 21] However the clinical significance of these findings is difficult to evaluate since in most studies only single sub-maximal doses of each antagonist were investigated. Blackwood and Northfield[21] reported an additive effect of poldine 8 mg if combined with a submaximal dose of cimetidine but that the same response could be obtained by increasing the dose of cimetidine alone. Saunders *et al* however found no additional decrease in nocturnal acid secretion when the dose of cimetidine was increased from 200 to 400 mg but a further response when an anticholinergic agent was added. In the present studies addition of atropine 2·4 mg/day to treatment with cimetidine 1·0 g/day failed to produce any additional benefit in terms of reduction in mean hourly 24 hour intragastric acidity or nocturnal acid output. However when the dose of atropine was increased to 4·8 mg/day the combination produced a marked reduction in volume and hydrogen ion activity.

Proximal gastric vagotomy also resulted in a more marked reduction in overnight gastric juice volume and hydrogen ion activity than treatment with cimetidine 1·0 g/day in cimetidine non-responders. Indeed the difference with respect to an effect on volume was spectacular: 59·6% compared to 0·13%.

These data all support the concept of a vagal component not amenable to inhibition as a result of H_2 receptor antagonism. Whether this is present in all patients but forms a greater component to the pathway for gastric secretion in non-responders is unknown.

PEPSIN SECRETION

The secretion of pepsin by the gastric chief cell is particularly sensitive to cholinergic stimuli and in studies in dogs with double pouches Guldvog and Bjørstad[22] have shown that vagal innervation is essential for a secretory response to food or pentagastrin. These studies also demonstrated that whilst atropine was a potent inhibitor of food stimulated pepsin output from the innervated pouch, cimetidine in doses of 25 to 400 mg iv either had no effect or resulted in an increase in pepsin output.

Further studies have suggested either that histamine H_2 receptor antagonists inhibit pepsin secretion only indirectly via reduction of volume[24] or that histamine has a biphasic effect on pepsin secretion with inhibition at low doses and stimulation at high doses.[9] In addition impromidine a specific H_2 receptor agonist and 4 methyl histamine have been shown to inhibit cholinergic stimulation of pepsin secretion in the dog.[10]

In man a number of studies have shown a reduction in stimulated pepsin output following administration of cimetidine or ranitidine and in several a dose response relationship has been demonstrated. Aadland and Birkstad[3] constructed dose response curves to histamine and pentagastrin and showed that cimetidine shifted these curves to the right. However the shift was not as great as the acid output dose response curve and they comment that there was no change in pepsin concentration. Doraschke *et al*[4] reported a dose related inhibition of pepsin concentration following intravenous infusion of ranitidine for the middle hour of a three hour infusion of pentagastrin. The authors comment that the inhibitory effect on pepsin was much less than that on acid concentration. However although acid output was profoundly inhibited the lowest mean hydrogen ion activity reported is 9 mmol/l which corresponds to a pH of about 2·0 an optimum for the measurement of peptic activity. Atropine had little effect on pepsin concentration in this study but they nevertheless nonetheless on the basis of the overall results with atropine that hypersecretion in duodenal ulcer patients is largely dependant upon a cholinergic mechanism.

Mohammed *et al*[11] have shown a reduction in pentagastrin stimulated pepsin output of around 60% during treatment with ranitidine and cimetidine and other studies have shown reductions in pentagastrin stimulated pepsin output following intravenous administration of cimetidine or ranitidine.[24] However, in these studies the decrease in pepsin output was a result of reduction in volume with no effect on concentration. Similarly ranitidine has been shown to inhibit histamine stimulated pepsin secretion but again with no significant change in pepsin concentration.[25]

A marked inhibition of nocturnal pepsin output

by ranitidine 50 mg p.o. has been reported in a group of seven patients with duodenal ulcer[1]. However, a pH of > 5.0 was recorded in 34 of 48 samples collected so that denaturation of pepsin may have contributed to these findings. In a similar study with cimetidine doses of 200 and 400 mg had no effect on nocturnal pepsin output in two of the three subjects studied on each treatment. In another study of nocturnal pepsin secretion Longstreth et al.[38] found no change in pepsin concentration following cimetidine 200 mg. After doses of 300 and 400 mg the effect on intragastric pH was so profound that peptic activity was not measured.

The results of other studies have suggested that the effect of H_2 receptor antagonists on gastric pepsin secretion may be more complex. During insulin stimulation Carter et al. have shown that although cimetidine 100 mg/h reduced acid output by 75.4% during the last hour of the study pepsin output was relatively unchanged and pepsin concentration was significantly increased.[39] Similarly Sheers and Roberts[40] have shown that whilst cimetidine 200 mg i.v. and ranitidine 100 mg i.v. inhibited pentagastrin stimulated pepsin output during insulin stimulation pepsin concentration increased with both drugs. In secretory studies carried out in nine patients with Zollinger Ellison syndrome pepsin output was increased 30 minutes after an oral dose of cimetidine 200 mg whilst acid output was reduced by between 50 to 70%.[41] We have found a similar increase in pepsin output following intravenous administration of cimetidine in two patients with Zollinger Ellison syndrome.[4]

In the present study nocturnal pepsin output was higher in patients classified as nonresponders (mean value 2.1 IU/h compared with 0.43 IU/h in the responders). Treatment with cimetidine 1.0 g/day resulted in an increase in pepsin output in both groups of patients and this was the result of an increase in pepsin concentration since volume was significantly reduced in the responder population.

A new method for the assay of peptic activity was developed for use in these studies. However, as in previous methods the technique involves substrate enzyme interaction at pH 2.0 and measurement of the product of the interaction. Validation studies showed excellent correlation with the haemoglobin substrate method of Berstad[4] and it seems unlikely that differences in methodology have contributed significantly to the results. All assays are carried out at pH 2.0 and so measure total potential pepsin activity rather than actual activity at the pH of the sample collected. Peptic activity in gastric juice remains relatively constant over the pH range 0.5 to 3.5 but thereafter there is a rapid fall off and at pH > 6.0 pepsin is irreversibly denatured. If gastric pH is raised to this level during treatment with an antisecretory agent, then any assay of pepsin in samples collected during that period will give low values. Whilst this could account for some of the overnight studies previously discussed it does not satisfactorily explain the results of studies during histamine and pentagastrin stimulation where intragastric pH remained low even following treatment with an H_2 receptor antagonist. It seems more likely that a dramatic reduction in volume of gastric juice observed affects on pepsin secretion *per se*. When pepsin concentration was reported most authors comment that it was unchanged. However this is not true in every case and dose related decreases have been noted. Further work is required to resolve these apparent differences.

In the present studies an entirely similar increase in nocturnal pepsin concentration and output was observed during treatment with ranitidine as well as cimetidine and during the infusion of the specific H_2 receptor agonist impromidine in a dose of 10 μg/kg/h mean basal pepsin output decreased from 3.65 to 0.21 IU/h. The decrease was noted in every subject. These data all suggest that these effects on gastric pepsin secretion are the result of direct interaction of the histamine H_2-receptor. However Peden et al. report an increase in pepsin output during the infusion of impromidine in a group of eight healthy subjects.

Previous reports of an increase in pepsin concentration during administration of an H_2 receptor antagonist have been in situations of increased vagal tone. The secretion of pepsin is largely under vagal control and it appears that some interaction between cholinergic and histaminergic control systems results in the changes in pepsin concentration recorded. When atropine 4.8 mg/day was combined with cimetidine 1.0 mg/day nocturnal pepsin output was reduced from a mean of 3.03 IU/h on no treatment and 4.01 IU/h during cimetidine alone to 1.1 IU/h. Gastric acidity was markedly reduced in this study which could have accounted for some loss in peptic activity but mean hourly nocturnal hydrogen ion activity was still 12.8 mmol/l which corresponds to a pH of 1.9.

How then should cimetidine resistant ulcers be treated? Ulcer healing is encouraged by low levels of intragastric acid and pepsin. This environment is produced by combining an H_2 receptor antagonist with an anticholinergic agent. At present the most promising drug to add to cimetidine is pirenzepine which has been reported to be highly specific in its effect on the muscarinic receptor of the gastric mucosa and thus may be without many of the side

effects associated with conventional anticholinergic agents.[41] However other reports have not confirmed this selectivity and side effects may be a problem.[42-46] The solution as far as medical treatment is concerned, probably lies in the development of an anticholinergic compound with true selectivity for the parietal cell. If however surgery is indicated by persistent failed medical therapy then good results can be expected with proximal gastric vagotomy.

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Ciguatera poisoning

I C Grant

Summary

Ciguatera is one world wide scale the ... n nine of the four broad classes of ichthyosarcotoxism currently described Third sease is contracted by the consumption of toxic flesh from any of many fish species which are usually safe foodstuff It is characterized by a combination of neural gastrointestinal and cardiovascular effects The incidence of the disease is climatically determined world wide and its appearance in the UK has recently been described The author personal experiences described together with some historical background and a review of current literature

INTRODUCTION

TOXIC food poisoning occurring after the ingestion of fish has long been recognised as a separate disease process from that of poisoning due to bacterial contamination of fish flesh

Four separate classes of ichthyosarcotoxism have been described on the basis of symptomatology and species specificity tetraodon poisoning gymothorax poisoning scombroid poisoning and ciguatera

Tetraodon poisoning is a severe often fatal disease due to a toxin contained particularly in the ovaries viscera and to some extent flesh of puffer fish and porcupine fish It is particularly prevalent in Japan where the raw fish is considered a great delicacy

Gymothorax poisoning from moray eel (gymothorax sp) is now considered by many to be a severe form of ciguatera[2] and this is borne out by the finding that the concentration of the toxin which causes ciguatera is many times higher in the moray eel (particularly in the liver) than in most other species

The inclusion of scombroid poisoning in the classification is now also in dispute and it is considered by some that this disease is due to the action of bacteria on histidine in muscle producing a histamine like substance which when ingested causes the disease.[3]

Ciguatera is throughout the tropical and semi tropical regions of the world probably the most important of these four classes of poisoning Not only is it very common but its distribution is widespread with cases reported from as far afield as the Caribbean Islands and the Great Barrier Reef off Queensland[4 5] and the fish implicated are usually valuable food species[6 7]

HISTORICAL

Ciguatera has been recognised as a disease entity although of uncertain aetiology in the Caribbean region since the mid sixteenth century[8]

The name was probably originally applied to an illness with similar minimal features caused by the ingestion of a univalve mollusc *Strombus gigas* which is eaten throughout the Caribbean and called 'Cigua' in Cuba It has since come to be used to describe a particular form of ichthyosarcotoxism wherever it is found

The armed services of several nations have had problems with the disease[11] at times so severe that instructions to eat no locally caught fish have been issued[14] As far as the Royal Navy is concerned the disease has been described although not always recognised for many years

A carefully documented account of ciguatera intoxication occurred in the New Hebrides in 1774 when members of Captain Cook's crew in HMS *Resolution* became ill after eating fish probably a red snapper The fish viscera were sufficiently toxic to kill one of the pigs carried on board.[1]

Captain Bligh after the mutiny on board HMS *Bounty* in 1789 and whilst adrift in the open boat wrote in his log on Wednesday 10 June that year that he and his crew had suffered a prodigious sickness after eating a fish, the description of which could well be ciguatera[6]

In 1808 Chisholm who is thought to have been a ship's surgeon presented a communication in which he describes ciguatera after eating a gray snapper in Grenada

Since then I can find no reference to the disease in the Royal Navy until 1977 when the officers of one of HM ships at sea in the Caribbean were afflicted

PERSONAL EXPERIENCE

On 24 October 1977 the officers on board one of HM ships at sea in the Caribbean were offered either steak or grouper steak for dinner The fish

had been caught about a week earlier off Great Bahama Island by the ship's divers and had been brought on board quickly cleaned gutted and frozen immediately. Nothing unusual was reported about the fish, apart from the fact that it was an unusually aggressive specimen subsequently classified as epinephelus species. In all 20 of the 42 officers ate fish 19 having standard portions and one a very small amount.

Within six hours of ingestion, all 19 people who had eaten fish described varying degrees of abdominal pain, vomiting and diarrhoea. Severity varied from mild diarrhoea only (in two patients) to severe diarrhoea, colic, vomiting and prostration. One patient rapidly became very dehydrated requiring large amounts of intravenous fluid replacement.

These gastrointestinal symptoms lasted for between 6 and 18 hours but during this period other symptoms had developed which clarified the diagnosis as ciguatera.

The earliest of these symptoms to appear—at about 8–10 hours after ingestion—were paraesthesiae and dysaesthesiae especially in the peripheries and associated with myalgia, weakness, giddiness and general malaise. In particular, patients complained of burning of the hands and feet, itching, and a reversal of hot/cold sensation so that hot tea felt icy cold and ice cream burned the mouth. This reversal of temperature sensation was in some also present in the limbs but was not as marked as in the mouth.

Four patients reported a most unpleasant complaint in that they had severe pain in the shaft of the penis on erection.

In general these neural symptoms lasted for about six weeks although some patients were still having problems at three months after onset. It was noted by everyone that alcohol exacerbated the paraesthesiae when taken in even small amounts and some people had exacerbations after eating fish—even frozen cod from UK which also caused a more minor recurrence of the vomiting and diarrhoea.

The symptology is summarised in *Table I* and compared with that reported in Fiji[4] and in a series of 3009 cases from the South Pacific in general.[10]

Clinical examination of the patients was on a large extent unremarkable. Most had a mild pyrexia initially which settled very rapidly. Seventeen had a slight tachycardia whilst the other two had bradycardia, one of 52 bpm which proved on ECG to be a sinus bradycardia, the other 46 bpm which was due to first degree heart block and which responded well to atropine. Two patients became hypotensive, one

Table I. Symptomatology—percentage of patients affected

Symptom or sign	*Antrim*	*Fiji*	*S Pacific*
Nausea	90	56	43
Abdominal pain	80	75	47
Vomiting	85	43	38
Paraesthesiae	85	66	90
Diarrhoea	79	—	71
Temperature disturbance on ingestion	74	—	86
Dysaesthesiae	53	22	—
Myalgia and arthralgia*	45	33	44
Pruritus	38	5	45
Sweating	31	15	37
Vertigo	16	12	43
Headache	37	—	60
Lacrimation	6	—	23
Dental Pain	8	—	28
Ataxia	Nil	—	38
Tremor	Nil	—	27
Neck stiffness	Nil	—	26
Rash	Nil	—	21
Bradycardia	11	10	—
Tachycardia	69	8	—
Hypotension	11	10	13
Dyspnoea	Nil	—	17

*Arthralgia (81%) Myalgia (82%)
— = Not recorded

requiring intravenous fluids in large amounts. Neurological examination 24 hours after onset provided objective evidence of diminished sensation and of diminished temperature discrimination but was otherwise normal.

All patients eventually made a full recovery and as far as can be ascertained are now symptom free and in good health.

DISCUSSION

The distribution of ciguatera is certainly widespread. The disease is known to occur throughout the Caribbean Islands in places on the Caribbean Gulf of Mexico and Pacific coasts of mainland United States, in all the archipelagoes of the tropical Pacific on the Great Barrier Reef of Australia in Japan and across the Indian Ocean to Madagascar [*]. In addition to being a cause of considerable morbidity in the endemic areas sporadic cases are now being seen with increasing frequency in inland USA and in the United Kingdom [1].

Throughout this wide general area it has long been known that toxic fish are usually associated with certain restricted reefs whilst fish from nearby reefs are not toxic. Detailed information about the location of toxic reefs is however difficult to compile and maintain due to the vast areas involved and because sudden fresh outbreaks have occurred while once toxic areas have declined [2]. It would appear that disturbance of the reef ecosystems either by natural events or by man may lead to an increased likelihood of toxicity [3]. These factors together with the increase in bulk fishing methods and bulk market distribution in the affected areas may explain the apparent increase in incidence over the last decade or so.

The fish species implicated in the causation of ciguatera are also many and varied but virtually all are either detritus feeding species or the large carnivores which prey upon these. All the species are usually good food fish and are often a staple food amongst local inhabitants. The frequency with which various fish are implicated in different areas obviously depends on local eating habits as well as the relative population of the species. *Table II* shows the different species most commonly implicated in ciguatera poisoning in Fiji, Tahiti[28] and Florida [4] but it should be stressed that these are only a few of the more than 400 species which have been implicated [4]. It should also be noted that this table takes into account only carnivorous fish, as the vegetarian species such as the surgeon fish which may cause up to 65% of the poisoning in Tahiti are not eaten in Fiji or Florida and are therefore excluded to make comparison more meaningful.

That the ingestion of flesh from these fish has caused ciguatera poisoning in man has long been known. Various theories of how the fish responsible became toxic in the first place have been advanced over the years but it is now generally agreed that intoxication occurs through the food chain of the fish involved.[2, 3]

Studies have shown that carnivores herbivores surface grazers coral feeders and sediment feeders may all be toxic to a greater or lesser extent and that samples of detritus from areas where toxic fish are found also contain a toxin or toxins. This has led to the identification of a dinoflagellate—*Gambierdiscus toxicus* (Adachi)—as the most likely cause of ciguatera being the original producer of the toxin which is then concentrated through the marine benthic food web. The intermediaries between *gambierdiscus* and man are not apparently affected by the toxin [5].

The toxin itself was first isolated in 1967 and early work suggested that this lipid soluble substance named ciguatoxin, probably produced an anticholinesterase effect [29]. However as more purified and larger amounts of the toxin became available and in vivo studies replaced the older in vitro ones it appeared that this was not the case and that a rather complicated biochemical process occurs affecting the control of sodium and possibly calcium metabolism in nerve and muscle cells [30]. More recent work still has suggested that more than one toxin is likely to be involved and notably

Table II Fish species implicated in ciguatera disease—percentage of total

Species	*Fiji*[a]	*Tahiti*[b]	*Florida*[c]
Sphyraenidae (Barracuda)	39	3	3
Lutjanidae (Red Snapper)	18	18	15
Lethrinidae (Grey Snapper)	15	15	[d]
Serranidae (Grouper)	12	34	61
Carangidae (Jacks)	4	14	[d]
Carcharhinidae (Shark)	3	—	—

snan toxin another lipoidal substance and maito-toxin a water soluble fraction of considerable potency have been isolated from both ciguatoxic fish and *gambierdiscus toxicus*. The toxins are heat stable and are highly resistant to all cooking and preserving methods including freezing

The syndrome known as ciguatera poisoning is a somewhat variable condition for which unfortunately no definitive diagnostic test is yet available The diagnosis at present therefore remains clinical with gastrointestinal upset associated particularly with neurotoxic symptoms as detailed above suggesting ciguatera There would appear to be little age or sex variation and little racial prevalence although it has been noted that Melanesians seem to suffer more commonly from pruritus ataxia, abdominal pain and weakness than do patients of other races [14] Whether this demonstrates a true racial difference in susceptibility to these problems or an inherent difference in the toxins present in ciguatoxic fish in Melanesia is not yet elucidated

The severity of the disease and particularly the neurotoxic effects would seem to be closely dose related inasmuch that persons eating smaller portions of the same fish are usually less severely afflicted and that fish species such as moray eel with very high concentrations of toxin in the flesh cause more severe symptoms than others

The onset of the illness is typical of a toxin food poisoning with most patients experiencing symptoms within six hours of ingestion and 96% being affected within 24 hours [4 15] The duration of gastrointestinal symptoms is usually short, but neurotoxic effects may persist for 12 weeks or even longer[4 11] and during this period recurrences are said to be associated with the ingestion of non-toxic fish not necessarily of similar species to the original intoxicator Morbidity is therefore considerable but mortality is apparently rare with only three deaths being reported in a series of over 3000 cases [15]

The treatment of ciguatera poisoning remains non specific It is probably undesirable to administer anti emetics or antidiarrhoeals as these retain the toxin in the gut for longer periods allowing further absorption with more pronounced sequelae Indeed it has been suggested that emesis and purgation should be employed in an attempt to rapidly eliminate the toxic

Recent successful treatment has been carried out in Hawaii by thoroughly cleansing the GI tract with enemas and magnesium citrate saline cathartics then instituting a strict diet containing no fish shellfish or their byproducts no nuts and no alcohol This together with the administration of high dose multivitamins is continued until the patient has been symptom free for at least three months The use of a prostaglandin synthetase inhibitor such as paracetamol or indomethacin is advocated to control headache and parasthesiae More severe cases particularly those with hypotension or heart block are additionally given intravenous calcium gluconate 6 grams per 24 hours until the serum calcium is normal There is some evidence that nifedipam may act as a direct antagonist to ciguatoxin at its target site[2 3] but whether calcium should be given to all patients remains a matter for debate [3]

In other series some success has been achieved using antihistamines to reduce itching and some of the paraesthesiae and atropine to treat bradycardias

The prevention of ciguatera on a world wide scale would be a mammoth and probably impractical task. Recent work has developed a radioimmunoassay to detect ciguatoxin in fish but to do so on a large scale would be vastly expensive

Within the Royal Navy however the disease should be avoidable if the following is noted

1 There is no way of differentiating toxic from non toxic fish.

2 Cooking does not destroy toxin

3 Do not eat fish considered harmful by natives Do not eat scaleless fish or moray eel

4 Avoid abnormally large carnivorous fish of all species on the premise that the larger the fish the more toxin it is likely to have absorbed from its food

5 Avoid the liver head roe and viscera of any fish

Research into this condition is currently being undertaken at several centres throughout the world Work is under way to find a method of controlling the population of *gambierdiscus toxicus* to elucidate further the mode of action of the various toxins to produce an economical method of detecting the toxins in fish flesh and to improve the treatment of the disease

Ciguatera remains at present however an important disease of considerable challenge to clinicians and one of which every medical officer likely to serve in tropical waters ought to be aware.

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unit ng, help in collecting papers from less well-known journals

POSTSCRIPT

I would be most interested to hear from any medical officer who thinks he may have experienced ciguatera or any other fish poisoning in the Royal Navy

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Coxsackie B infection in a Scottish general practice

B. D. Calder and P. J. Warnock

Summary

The authors describe 38 cases of protracted illness characterized by varied multisystem symptomatology. Significant antibody titres to Coxsackie B viruses suggesting recent infection were found in three 38 patients (47% of 81 cases investigated). This syndrome has many of the features of myalgic encephalomyelitis (ME) a condition which has frequently been found in closely clustered epidemics but seldom as sporadic or endemic form. The reported cases emerged over a four year period and fresh cases continue to appear.

INTRODUCTION

FOUR years ago we began to recognise a chronic and debilitating illness affecting mainly young, healthy adults. Striking features were multisystem symptoms and fluctuating course of relapse and remission, generally leading to a gradual resolution over many months or even several years. Significant titres of neutralizing antibody to Coxsackie B group viruses were detected in the serum of some patients and we noticed an association between this syndrome and serological evidence of recent infection by these viruses.

This illness itself is similar to myalgic encephalomyelitis (ME) which was reviewed comprehensively by Behan and which has been closely linked with Coxsackie B infections in two recent reports from Scottish general practices. Fagan and colleagues's description of 18 cases suggested a fairly clear cut epidemic with a number of instances of close contact spread.[1] Keighley and Bell[2] examined serum from 20 patients with ill-defined chronic illness and found elevated antibody titres to Coxsackie B viruses in 16 cases, of which 13 were eventually thought to be ME: these cases occurred in an apparently sporadic pattern without obvious connection between patients. In another study in the West of Scotland 1000 adults were screened for Coxsackie B antibodies and 10% were found to have titres ≥ 256 and 4% ≥ 512.[3]

We decided to look for evidence of Coxsackie B infection in patients with the ill-defined symptoms described above.

PATIENTS AND METHODS

The practice of 9500 patients covers half the population of Helensburgh, a small seaside town on the Firth of Clyde. Many of these patients are Glasgow commuters and many others are employed at two local defence establishments. A large number of Royal Navy personnel live in the area, and the practice is responsible for the care of their families although not of the servicemen themselves.

Between 1978 and August 1983 investigations were carried out in 81 cases of suspected Coxsackie B infection. The serological tests were performed at the Regional Virus Laboratory at Ruchill Hospital, Glasgow.

RESULTS

The results of serological tests in suspected cases of Coxsackie B infection after 1978 when an isolated case occurred are shown in *Table I*. Eighteen of the 38 positive cases were confirmed in the first six months of 1983. Thirty eight (47%) of the 81 patients examined were found to have significantly raised titres (>256). Details of 38 patients with raised Coxsackie B antibody titres are listed in *Table II*. Six other patients had borderline titres of 128 to serotypes B1, B3 and B5 but it was not clear whether these cases belonged to the positive group or not. Antibodies to a variety of Coxsackie B serotypes were found of which B4 was the commonest (25 cases). However we were unable

of serology tests in suspect cases
ne solated case of Coxsackie B infection

	Positive	Negative
	N	N
	3	5
Jul	9	12
1983	7	12
1984 August	18	14

to show a clear relationship between any particular serotype and specific symptom complexes. We failed to demonstrate any rising antibody titres suggesting that infection was well established before the investigation.

Classification of symptoms many of which were non specific was difficult. Despite some overlap the 38 patients can be divided into two groups on the basis of different symptoms

1. A cardiac group in which palpitations were the commonest feature (24 patients)
2. A smaller but more severely ill neurological group (six patients)

More vague symptoms, such as malaise were common to both groups.

Typically healthy adults in their thirties were involved, but the age span was 18 to 67 years with a mean age of 36·7 years. The female to male ratio was 25:13.

CASE REPORT

Two representative cases are described.

Case 34

A previously well fit and healthy 22 year-old schoolteacher presented in December 1980 with a two-day history of tingling and numbness patchy in distribution but mainly involving the left side of her body with headache and pain and tingling in the distribution of the maxillary division of the right trigeminal nerve. She described feelings of panic and apprehension in the first few days of the illness.

She developed vertigo and complained of tightness around her chest and throat, pain in her left ear and difficulty in opening her mouth. Further discomfort developed in the joints of both hands particularly on the right side and recurrent headache became a problem.

Investigations included full blood count, erythrocyte sedimentation rate (ESR) and blood film liver function tests plasma electrolyte and serum protein assays. All tests were normal as was cerebrospinal fluid (CSF) examination. Radiographs of teeth sinuses and chest were normal. Brain scan was normal but electroencephelography (EEG) showed evidence of bilateral disturbance. Her serum showed Coxsackie B titres of B3 512/512 and B4 256/256 suggestive of recent infection. Repeat EEG eight weeks later showed continuing bilateral abnormalities.

She continued to have joint and facial pain and developed intermittent disturbances involving zig-zag lines and patchy scotomata. Her progress has been slow with several weeks off work in the initial stages followed by frequent relapses lasting one or two weeks slowly becoming less intense and less frequent. During these relapses she can experience any of the symptoms already described as occurring in the initial episode and she is frequently miserable during these periods.

In February 1982 she developed symptoms of loss of concentration, early morning wakening, irritability and anorexia all of which persisted. These symptoms responded to eight weeks treatment with dothiepin hydrochloride. Her relapses are now occurring every two months or so but she is still a long way from the fit active young woman that she was before December 1980.

Case 33

A fit, healthy 45 year-old man with no previous medical history presented in December 1980 with feelings of fullness in his upper abdomen, increased awareness of his heartbeat and dropped beats. He was apprehensive and feared for his life during the episodes of palpitation. He had been feeling generally unwell for several days before presentation and had been noticing increasing shortness of breath on exertion. His Coxsackie titres were >1024 to serotype B2 suggestive of recent B2 infection. Atenolol 100 mg per day settled his cardiac symptoms to a great extent, but we were only able to discontinue treatment after 14 months. Since then, his exercise tolerance has slowly improved but he still has bouts of palpitation and unfitness from time to time usually more pronounced when he is fatigued from other causes.

Table II. Details of patients with raised Coxsackie B antibody titres (arranged in ascending order of antibody levels)

Case no.	Age (years)	Sex	Symptoms*	Highest antibody titre	Serotype	Additional features†
1	32	F	ABC	256	B4	
2	31	M	AE	256	B4	Z
3	38	F	B	256/256	B3 B4	Y
4	35	F	BDF	256	B4	
6	31	F	ABF	256	B4	XY
6	33	M	AB	256	B2	
7	48	F	AB	256/128/256	B1 B3 B4	
8	38	M	BD	256	B2	Z
9	45	F	BE	256	B4	
10	29	M	ABCG	256	B3	
11	43	M	B	256	B2	
12	32	M	ABC	256/256	B2 B3	
13	19	F	ABCFG	256	B4	
14	38	F	ABC	256	B2	
15	56	M	ABF	256	B2	Y
16	31	F	AG	256	B4	
17	20	F	ABCDE	128/256	B2 B4	
18	37	F	ACE	256	B6	
19	62	M	A	256/256	B2 B3	Z
20	31	F	ABCE	256/256	B3 B4	
21	36	F	AB	512	B4	
22	29	F	CEG	512	B3	XY
23	33	M	ABC	512	B4	Z
24	22	F	CG	512/256	B3 B4	Z
25	40	M	ABD	256/512	B3 B4	
26	57	F	ADF	512	B2	Y dud of Ca pancreas
27	30	M	ABF	512/128	B2 B4	
28	36	F	ABEF	512/256	B2 B4	Y
29	36	F	ABF	512	B2	
30	37	F	BDE	512/256	B1 B3	
31	24	F	C	512	B4	
32	59	M	BF	512	B4	
33	45	M	F	>1024	B2	
34	35	F	BEF	>1024	B4	X
35	26	F	A	>1024	B4	Z
36	38	F	ACG	>1024	B4	
37	41	F	ABDEF	>1024/512	B2 B4	
38	24	F	E	>1024/512	B2 B4	

* A— General symptoms malaise sweating lightheadedness, headaches.
B— Cardiovascular palpitations chest pain dyspnoea
C— Musculoskeletal myalgia
D— Vestibular vertigo, dizziness
E Psychiatric depression anxiety poor concentration
F Gastrointestinal anorexia vomiting diarrhoea
G— Neurological paraesthesia cranial nerve palsy slurring of speech

† X = Onset within six months of parturition
Y *Significant psychiatric history*
Z *Required hospital admission.*

TREATMENT

These patients have a high morbidity and a high consultation rate In 15 cases beta adrenergic blocking agents were used for troublesome palpitations and a marked reduction in symptoms was experienced. These drugs seemed to give some relief from the feelings of panic and impending death described by many patients, so perhaps these distressing features were due to the cardiac abnormality Minor tranquillizers were also used in

small doses to help the anxiety symptoms which commonly occurred. Frequent reassurance and support are required over long periods: symptoms persisting for several years in some case

DISCUSSION

Our findings suggest a relationship between Coxsackie B infection and the illness described. Positive serology was found in selected cases far in excess of the expected rate for the population. The results confirm the findings of Keighley and Bell [3] who described the situation in a rural practice 30 miles from our own, neither group was aware of the activities of the other until recently.

The possibility of Coxsackie B infection was suspected in a number of patients who posed diagnostic difficulties and these accounted for some of the seronegative results. Eight of these patients had past psychiatric histories which could have accounted for their continuing vague symptoms. In several other seronegative cases definite diagnosis of quite different kinds were subsequently made. These included cerebral neoplasm, multiple sclerosis, cardiomyopathy and rheumatic heart disease. (Coxsackie B viruses have been associated with heart disease [5]).

The female to male ratio was similar to previous findings. We have not seen any patients under the age of 18 years in whom we suspected this illness. There have been no obvious connections between the cases, but we have noted a marked socio-economic class bias. There have been many more cases in social classes I and II than would be expected if distribution by social class were random. Only seven of the 38 patients live in local authority housing, the remainder being owner-occupiers. Another striking feature was the dearth of cases involving families of Royal Navy personnel: we found only three cases, despite the fact that this group comprises one third of our practice. Probably because of our increased awareness of the syndrome, we continue to find new cases and there is no sign of a fall in the incidence.

Previous reports have generally dealt with discrete epidemics rather than the sporadic or endemic pattern which we have found. We have no evidence to suggest a seasonal variation either in date of onset or date of presentation nor do we have any evidence that the infection was acquired outside our local area or abroad. We believe that the diagnosis is frequently being overlooked in both hospital and general practice, and that a label of psychoneurosis is erroneously applied in many cases. Even in the absence of specific treatment we have found that patients and their relatives gain relief from the discovery of an organic diagnosis in these situations.

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Smoking cessation: Experience at sea using nicotine chewing gum and including a period of active service

J O. Soul

INTRODUCTION

DURING 1981 and 1982 HMS *Hermes* had a ship's company of about 1500 men, of whom an estimated 60% were cigarette smokers consuming in excess of 15 cigarettes per day. These men had access to duty free and therefore relatively cheap, cigarettes. They were for the most part fit without significant respiratory disease. The stimulus for these men to discontinue smoking was therefore small.

The long term hazards of smoking are clearly recognised [1] and the addictive nature of cigarette tobacco well documented. Nicotine impregnated chewing gum (Nicorette, Lundbeck) has been proposed as an aid to smoking cessation. In view of the unusual captive population, a trial was therefore proposed in which a self selected group of volunteers would attempt smoking cessation with the aid of nicotine chewing gum.

SUBJECTS AND METHODS

Volunteers

The whole ship's company was informed through daily orders of the proposed trial, and in due course a memorandum was published giving the details. Volunteers were invited to attend the Sick Bay where they were issued with a pre trial questionnaire. About 230 questionnaires were issued.

Questionnaire

This had two functions. Firstly it selected out a small group who initially showed an interest but lacked the necessary motivation to complete the questionnaire and therefore were not entered into the trial. Of the 230 questionnaires, only 190 were returned.

Secondly the questionnaire was designed to measure the degree of nicotine dependence of the volunteer. The series of questions was based on a study by Fagerstrom and could be marked to give a nicotine dependence score on a scale from 0–11.

It was stressed verbally to all volunteers that this was a clinical trial and not a crusade and indeed the author continued to smoke for the whole of the trial period.

Smoking habits of volunteers

Included in the trial were all volunteers whose current average daily consumption of tobacco exceeded 15 cigarettes a day and who claimed to be sufficiently motivated to attempt total smoking cessation. Those unlikely to remain in the ship for the one year follow up period and dentrate wearers who were expected to have difficulty in chewing the gum, were excluded from the trial.

Participants

Of the 230 men who expressed an interest in the trial 190 completed the pre-trial questionnaire and of these 161 were subsequently entered into the study. It started in September 1981 and was intended to run for one year. Once accepted into the trial participants were seen in groups and given an initial supply of 100 pieces of gum each containing 2 mg of nicotine with both written and verbal instructions on its use according to the manufacturer's instructions. Further gum could be obtained from the Sick Bay as required.

Participants were asked to return to the Sick Bay

at two-weekly intervals for assessment until the sixth week and thereafter they were assessed at 3, 6 and 12 months from their start date. At each attendance a proforma was completed.

Follow-up

Assessment included a record of the average number of cigarettes smoked each day and a record of the body weight at each assessment point. Whilst the man continued to use the gum the daily consumption level, side effects, effect on work performance, and usefulness of the gum as an aid to smoking cessation were all assessed by each volunteer. When regular gum use ceased withdrawal problems were assessed.

Dosage of the gum was ad libitum to the individual's optimum level. Regular use was encouraged for up to three months before withdrawal was actively encouraged. Although 4 mg gum was available, none was required.

Exclusions

Participants who were unable to stop smoking within one month of entry to the trial and those who failed to attend for assessment at any time when they were due were withdrawn from the trial as failures.

Claims of abstinence from smoking were accepted on trust and, indeed, those who continued not to smoke were well known in the ship and peer group surveillance was considered sufficient.

There were no facilities on board for measuring exhaled air carbon monoxide levels and the ship's operational commitments precluded the assessment of blood carboxyhaemoglobin levels and thus indisputable evidence of abstinence was not available.

RESULTS

One hundred and sixty one men started on the trial and by the three month assessment point only 18 were still tobacco abstinent, a three month success rate of 11.2%. Those 18, however, continued to be abstinent for the remaining nine months of the trial period.

Of the 143 men who were withdrawn from the trial as failures, by far the majority were withdrawn at the four week assessment point, either because they did not attend or because, in spite of using the gum, they had continued to smoke. Various reasons were given for their inability to remain abstinent. The main cause appeared to be a lack of understanding of the concept of the gum as an aid to smoking cessation. Many thought it was a nicotine cure and were disappointed at the apparent lack of cure after a few days. Some volunteers complained of gum unpalatability, but this was for the most part due to a disregard of the manufacturer's instructions on its use.

Further analysis of the group of failures was not possible since all the data in the pre-trial questionnaires was lost at sea.

The 18 men who were still abstinent at three months continued their abstinence to the end of the trial period. Their mean age was 31 (18–52) and they had smoked for an average of 15.5 years (5–34 years). All smoked more than 20 cigarettes per day and they had an average Fagerstrom dependence score of 7 (Scale 0–11). All the volunteers included health as their prime motive for attempting cigarette withdrawal and all had made previous attempts to give up smoking.

Initially the average dose of gum chewed was 10 × 2 mg pieces each day which in all cases decreased with time. The number of men who still claimed to be using gum at each assessment is shown in *Fig. 1*.

Of the three participants still using the gum at the 12 month assessment, two were only occasional users at times of stress and the other claimed to be gum dependent. He subsequently transferred his craving to a non-nicotine chewing gum. There were no other problems associated with gum withdrawal.

Side effects were minimal and usually limited to the first week's usage. They included mouth irritation, bad taste, hiccoughs and mouth ulceration. Weight gain occurred in one patient only who by 12 months had gained 2.2 kg. With the exception of one man who reported speech impairment when chewing, there were no other instances of the gum affecting the ability of the men to carry out their duties.

DISCUSSION

A minimal success rate of 11.2% in achieving long-term abstinence from smoking may not appear impressive at first sight. The population studied in

2 weeks	4 weeks	8 weeks	3 months	6 months	12 months
18	14	11	8	6	3

Fig. 1

this trial was unselected young, healthy individuals with unlimited supply of cheap cigarettes. There was no intended ongoing psychological support in this trial for the volunteers and they were subjected to long periods of boredom and rough weather at sea. There was therefore a high relapse rate.

The main factor which contributed to this high relapse rate was undoubtedly the lack of stimulation. There is no doubt that the majority of the failures simply lacked the necessary motivation to give up smoking but thought the gum to be an easy route.

In contrast, the self selected 11.2% continued to abstain for the full 12 months. During this time they endured the temptation of a long, boring and uncomfortable trip to North America, Christmas leave and finally and perhaps remarkably war.

Military morbidity is known to increase significantly the proportion of smokers in an affected population and the number of cigarettes they smoke.[3] Such a period is clearly a poor time to attempt to give up smoking. Nonetheless all 18 men who abstained from smoking in the trial served in *Hermes* throughout the Falklands Campaign and none succumbed to the stress involved or indeed to the many gifts of cigarettes lavished on the ship's company during the campaign.

Peer group support is also a strong factor in smoking cessation. In this trial five of the 18 non smokers were chiefs of whom the senior was the Fleet Chief Cook. Clearly this mutual support and encouragement was a strong factor in maintaining abstinence in this group.

The results of this study have in several respects confirmed the findings of the report of the Sub-committee of the British Thoracic Association[4] although the trials were in no way comparable. That trial was a prospective study carried out to compare four different methods of assisted smoking cessation in a group of 1550 patients all suffering from smoking related diseases. One of their conclusions however was that nicotine chewing gum was more effective than placebo gum as an aid to smoking cessation in a highly motivated gratefully selected group of patients who had access to ongoing psychological support. Overall their success rate was comparable with this study.

CONCLUSION

Nicotine impregnated chewing gum when properly used in a well motivated and supported population may be a useful aid to smoking cessation. A group of 18 officers and men in HMS *Hermes* out of a trial group of 161 self-selected volunteers remained tobacco abstinent for 12 months using the gum as an aid. All the men who commenced on remaining tobacco abstinent served in the ship during the Falklands Campaign.

ACKNOWLEDGEMENTS

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Dental health of men in the Royal Navy 1978–80

G B Keeble and A J Rugg-Gunn

Summary

Since there have been few reports of the dental health status of armed services personnel a survey was undertaken of 742 men in the Royal Navy/Royal Marines over the same period as the Adult Dental Health Survey of the United Kingdom in 1978. Free comprehensive dental care is available to armed services personnel in contrast to UK civilians who have poorer access and have to pay a share of the cost of dental care. It was thus possible to compare the effectiveness of two systems for maintaining adult dental health. Comparisons of dental health of men in the RN/RM and the UK were made for four 10 year age groups between 16 and 54 years. Edentulousness was much less common in the RN/RM reaching a maximum of 5% compared with 27 % in the UK at age 45–54 years. The mean number of decayed teeth in dentate males in the RN/RM was 0·8 teeth or less in all 4 age-groups. The total DMFT was similar in the two groups except in the oldest 10 year age group when the RN/RM men had 3 sound teeth more than their civilian counterparts. The results suggest that although RN/RM men keep their teeth and have decayed teeth filled any preventive care is masked by the high level of disease already present by early adulthood and the inability of the DMFT index to detect further treatment of teeth.

INTRODUCTION

Royal Navy Dental Officers have the responsibility of ensuring that Fleet personnel have such a standard of dental health that they are fit to serve whenever and wherever required. The Dental Officers provide for management simple data on the group dental health state of the ship or unit as the operating efficiency of personnel may be reduced by dental ill health. They also provide regular returns of treatment carried out. This collection of information yields valuable data concerning the dental manpower requirement and current dental practice. It does not however provide information on the average dental state of groups of individuals nor does it identify any changes in the dental state of servicemen throughout their service life.

Some studies have investigated the dental state of the RN but, in general these have been confined to small age-bands at the time of entry. It was therefore decided that an extensive survey of the dental health of RN and RM personnel of all ages should be undertaken and this was carried out between 1978 and 1980. The intention of the survey was to provide a baseline against which subsequent changes in dental health could be monitored in order to assess the effectiveness of the RN Dental Service in its goal of continually improving the health of RN/RM personnel.

The first national survey of adult dental health in this country took place in 1968.[1] A decade later this was repeated with two aims: first, to detect changes in dental health over the preceding ten years in England and Wales and second, to establish a new baseline for United Kingdom adult dental health since this survey was extended to include Scotland and Northern Ireland. The availability of this 1978 UK Adult Dental Health survey report[2] made it possible to compare the dental health of RN/RM personnel and UK civilians. This was considered valuable in order to assess the dental health in relation to illness to treatment which is particularly good in the RN. However such comparisons should be made cautiously because of the difficulty of standardising methods between surveys particularly with respect to the recording of decayed surfaces.

The RN has female serving personnel in the RN WRNS and QARNNS but because their total numbers are small and because their service careers are frequently short, it was necessary to limit the survey to male personnel. Similarly there are very few RN/RM male personnel serving over the age of

54 years and so the 1978–80 RN/RM Dental Health Survey was restricted to male personnel in the 16–54 year old range

METHODS

Sampling

In the 1978 survey of Adult Dental Health in the United Kingdom sampling was carried out such that each eligible person over 16 years had the same chance of being sampled. This meant that the sample ratio for each age year was approximately equal and the mean number of people sampled did increase only slightly between 16 and 54 years. However the modal age in the RN/RM is 20 years with a rapid decline in numbers with age especially after 40 years. To obtain valid comparisons with the UK figures which were given for 10 year age groups it was necessary to sample the RN/RM male population by each age year separately. The sample ratio was varied to ensure that distribution of the number of subjects in each age year within each 10 year age group, was the same as that observed in the UK. If a sample of RN/RM personnel had been made where every person within each 10 year age group had the same chance of being sampled, dental health figures obtained for each 10 year age group would reflect the dental health of the younger subjects as they would be much more numerous than the older subjects in each 10 year age group. Thus data from such a simple sample would not be satisfactory for comparison with the UK 10 year age group data although it would accurately reflect the dental health of males in the RN/RM. The sampling frame was male officers and ratings serving in the Royal Navy or Royal Marines excluding the small number of University Cadets and Career Service personnel whose provision of dental care was considered atypical.

It was decided that sufficient precision would be obtained with a target sample of 1000 or approximately 250 in each of the four 10 year age groups. This was equivalent to an overall sample ratio of approximately 1 in 66. Sampling was carried out from service records during 1980. Because dental health is related to social class sampling of RN/RM personnel was stratified on officer/rating classification. Once the sampling frame and sampling ratios were agreed the individuals to take part in the survey were randomly selected by computer from RN central records and their age and unit identified.

Obtaining the dental information

The geographical distribution of the sampled persons did not allow a single or group of examiners to inspect all the subjects and those clinical features requiring judgement and not easily quantifiable could not be reliably assessed. Thus unlike the UK survey the record of the periodontal state, the condition of the soft tissues and orthodontic classification were not recorded.

Units were asked to provide the dental records of each person sampled. From these records a chart was compiled using all the information up to the person's last attendance. If no dental chart had been raised since 1978 (a full chart is frequently not made at recall) the dental officer responsible for that person was asked to carry out an examination and forward the records and a copy of the chart. Dental officers were told that the data were needed for a survey of dental health in the RN but not that comparisons would be made with UK civilians. Compensation was made in the data for differences in the age at selection and the age at which a dental examination was carried out.

The records and charts were used to calculate for each person the number of teeth missing, sound and untreated filled otherwise sound filled and decayed but restorable decayed but restorable for extraction or unsound according to the Adult Dental Health Survey method of classification. Bridged teeth were recorded but counted as missing. Deciduous crowns were recorded as filled and decayed but restorable. The presence of dentures and the material used in the dentures were recorded as in the UK survey. A record was kept as in the UK surveys of the nature of the last course of treatment.

RESULTS

Of the 970 records sampled for inclusion in the main survey 742 (76%) were obtained and were usable (*Table I*) in the majority of cases (68%) a full dental chart had not been made since 1978 and a dental examination was carried out by the dental officer. This was achieved between May and September 1980. 50 dental officers collected this information. Some of the returned forms were unusable due to incomplete data but the proportion was very small. Of all males in the RN only 3.3% were aged 45–54 years and for some years in this age group all RN rating personnel were sampled. However inside each 10 year age group the number of usable records was evenly distributed over the age years. The percentage of officers in the RN/RM sample in each age group varied between 13 and 17% with an overall average of 14% which was the same as occurred in the RN/RM population at the time of sampling.

Table I Table recording obtained of male RN/RM personnel in four age groups The number examined is given in parentheses. The percentage of officers in the RN/RM is given

Age group (y)	Officers	Ratings	Percentage of officers	Total RN/RM
16–24	29 (32)	200 (231)	13	229
25–34	33 (40)	198 (235)	14	231
35–44	25 (30)	153 (200)	14	178
45–54	18 (28)	86 (172)	17	104
				742

Edentulousness

While the percentage of males in the UK who were edentulous rose from zero in the 16–24 year age group to 27% in the 45–54 year age group the corresponding rise was zero to 5% in the RN/RM (*Table II*). Edentulousness in the RN was 1% or less until 45 years of age

The dentate mouth

The number of sound and untreated teeth in RN/RM personnel fell from 17·6 at age 16–24 years to 13·1 at age 45–54 years (*Table III*). There was little difference between RN/RM and UK personnel in the number of sound and untreated teeth, or DMF teeth under the age of 45 years (*Fig 1*). In the 45–54 year age group the RN/RM dentate males had an average of 2·3 sound and untreated

Table II Percentage of males edentulous on the RN/RM and the UK in four age groups

Age group (y)	RN/RM %	UK* %
16–24	0	0
25–34	0	4
35–44	1	10
45–54	5	27

* Source: Adult Dental Health Vol 23 Table A1

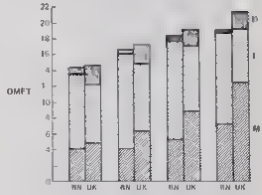

Fig 1 The number of teeth decayed (D), missing (M) or filled (F) for dentate RN/RM and UK males in four age groups.

Table III The mean number of teeth in each condition in dentate RN/RM males in four age groups

	Age group (years)			
Basis	16–24 229	25–34 230	35–44 177	45–54 58
Teeth				
Sound and untreated	17·6	16·2	13·7	13·1
Missing (all causes*)	4·1	4·5	5·2	7·1
Filled (otherwise sound) (including crowns)	9·4	11·9	12·2	11·1
Crowned (otherwise sound)	0·1	0·2	0·2	0·4
Decayed and restorable	0·3	0·2	0·1	0·1
Filled and decayed	0·5	0·4	0·6	0·3
For extraction	0·0	0·0	0·0	0·0
Total	32	32	32	32

* Given by the upper teeth.

teeth more than males in the UK While the number of missing teeth in RN/RM dentate personnel rose from 4 1 in the youngest age group to 7 1 in the oldest age group it rose from 4 8 to 12 3 per dentate male in UK The mean number of filled teeth (excluding crowns) rose slightly from 9 4 at 16–24 years to a maximum of 12 2 at age 35–44 years in the RN/RM It was higher in the RN/RM than in the UK in all four age groups, this difference becoming more pronounced as age increased (*Fig* 1) In all four age groups the mean number of teeth requiring filling or extraction was always less than one tooth in the RN/RM (*Table III*)

Crowns, bridges and dentures

The mean number of crowned teeth in the RN/RM rose from 0 1 at age 16–24 years to 0 4 at age 45–54 years (*Table III*) Twenty one bridges and 71 partial dentures were recorded in the 735 dentate RN personnel (2 8 and 9 6 per 100 subjects respectively) 40% of the partial dentures were metal based compared with the UK figure of only 12% '

The last course of treatment

The low prevalence of tooth extraction in the RN/RM is also evident in *Table IV* While only 4% of RN/RM males aged 16–24 years had one or more extraction during their last course of treatment, 22% of similarly aged males and females in UK had had extractions The corresponding percentages for the RN/RM and UK in the three older age groups were 8 and 27 4 and 33 and 37 respectively Although at 16–24 years there was little difference between the RN/RM and UK in the percentage requiring neither fillings nor extractions at the last course of treatment, by 45–54 years over twice the proportion of RN/RM personnel required no fillings or extractions compared with the UK.

Officer/rating differences in dental health

A comparison of dental health between officers and ratings was not a primary objective of this study However analysis of these data revealed little difference between the dental state of dentate officers and ratings although none of the 105 officers included was edentulous compared with 7 edentulous ratings (0 9%) There was a tendency towards fewer missing teeth in officers compared with ratings under 35 years but this was not found in the older two age groups The number of filled teeth in officers was equal or slightly (<1 tooth) more than that observed in ratings below the age of 45 years In the oldest group the officers had 2 2 more teeth filled than ratings The number of decayed teeth in officers was equal to or less than that found in ratings in the four age groups but the difference was never greater than half a tooth and the absolute number of decayed teeth did not exceed 0 8 teeth in officers or ratings in any of the four age groups

DISCUSSION

Reports of the dental health of armed service personnel are rare This is regrettable because they form a group of adults for whom comprehensive dental care is readily available for as long as they remain in the service No direct charge is made against the RN/RM individual for treatment rendered including provision of dentures crowns and bridges A system of regular recalls and inspections is designed to ensure that servicemen maintain a high state of dental health Personnel are encouraged to make use of dental facilities which are usually provided close to their place of work Only when men serve in small ships or detachments is dental care not readily available Even then the development of portable dental surgeries has reduced these periods without dental cover to a minimum

Table IV The percentage of dentate males in the RN/RM and dentate males and females in the UK* classified according to the major type of treatment received at their most recent course of treatment for tooth age groups

		16–24		25–34		35–44		45–54	
	Sex	RN 229 %	UK 672 %	RN 230 %	UK 773 %	RN 177 %	UK 636 %	RN 59 %	UK 476 %
NE	NF	39	35	47	32	51	28	57	25
NE	F	57	43	45	41	46	38	39	37
E	NF	1	13	3	15	2	23	1	25
E	F	3	9	5	8	2	10	3	5

NE, no extractions, NF, no fillings E, extraction(s) F, filling(s)
*Source Adult Dental Health Vol 2? Tables 10 4 Figures for males only are not available

The National Health Service aims to provide dental care for the UK population, but it is known that factors such as access to dental surgeries[4] and patient charges[5] deter adults from obtaining dental care. In 1978 only 43% of adults in the UK said they received regular dental inspections and care.[3] A comparison of the dental health of service personnel and civilians is therefore of interest.

In order to be comparable, methods used in the UK survey had to be followed as closely as possible in the RN. A method of sampling was used that enabled valid comparisons of 10 year age groups to be made. Unlike the dentate persons in the UK survey, only some of RN/RM personnel received a dental examination as part of the survey due to the problem of examining a geographically remote randomly sampled group. Likewise the rapid movement of personnel from ship to ship resulted in acceptable records being available for only 76% of the RN/RM sample. If all the subjects had been inspected as part of the survey, it is possible that the number of decayed teeth might have been slightly higher than that recorded by collating past records. However, this bias is likely to be minor since most personnel are seen at less than one year intervals and the rare dental records indicating a last attendance more than 2 years previous (before 1978) were not accepted. It is unknown how the level of caries diagnosis in the RN compared with that used by the 64 examiners in the UK survey, but in view of the use of the rounded tip probe in a domestic environment in the latter survey it is unlikely that caries diagnosis in the RN was more lenient than in the UK survey. Nevertheless caution is necessary when comparing the number of decayed teeth in the two populations. The large differences in the number of teeth missing or filled however could not be accounted for by differences in diagnosis.

Comparisons of the findings of the UK and RN/RM surveys revealed that edentulousness was much less common in the RN/RM. While 27% of 45–54 year old males in the UK were edentulous only 5% of RN/RM 45–54 year olds were edentulous. The mean number of teeth to be filled or extracted was low in the RN/RM, about a quarter the number recorded in the UK (*Fig. 1*). It was highest (0·8 teeth) in the 16–25 year age group and lowest (0·4 teeth) in the oldest (45–54 year) group (*Table III*). While the number of missing teeth rose to a mean of 12·3 teeth per person in the UK compared with only 7·1 teeth in the RN the mean number of filled otherwise sound teeth per person was much higher in the RN/RM (11·1) compared with 6·6 in the UK in the oldest age group.

The mean DMFT of dentate RN/RM personnel (*Fig. 1*) increased by only 4·3 over a 30 year period from mean age 20 years, equivalent to one tooth every 5 years. The extent to which filled teeth were refilled is unknown. Refilling of teeth although recorded as a course of treatment, does not affect the DMF index. Extractions also do not alter the total DMF, only the proportion of the individual components of this simple index.

Educational level may affect dental health and it is possible that differences in educational level between RN/RM personnel and civilians might account for the differences observed in *Fig. 1*. However, within the RN/RM educational or social class differences did not appear to affect dental health, since officers and ratings had a similar dental status. Edentulousness was absent in the officer sample and very rare (0·9%) in the ratings' sample, there was also little difference in total caries experience (DMFT) between dentate officers and ratings. However, interpretation should be cautious because of the small number of officers sampled.

From this survey it would seem that the dental health of RN/RM males aged 16–54 years is better than that of their civilian counterparts in that they are far less edentulous and have few decayed teeth. It would seem that they have more chance of having their decayed teeth filled rather than extracted and that their teeth are maintained in a good state with regular treatment and inspection throughout the whole of their service career.

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Exercise Sea Surge

P Cave

Exercise Sea Surge 83 was a short term exchange of RAN/RNZN personnel with a similar number of RN personnel the aim being to broaden the professional horizons of the selected officers and ratings by exposing them to the methods and equipment of other navies

I was privileged to be a member of the RN party which left UK on 27 July in an aircraft of the Royal New Zealand Air Force We flew direct to Gander in Newfoundland where the aircraft refuelled, and then on to Andrews Air Force Base ie Washington DC for an overnight stop. Arriving at Fairfield, California we had a free day for sightseeing in nearby San Francisco before going on to Honolulu on 30 July for another overnight stop Then came the longest leg of the flight—Honolulu to Pago Pago West Samoa for refuelling, and on to Auckland New Zealand where some of the party disembarked The remainder of us travelled on to Richmond RAAF Base on the outskirst of Sydney where we spent the night. Early next morning RAN transport took us in to the city and those members of the party who were staying in the Sydney area were escorted to their host ships and establishments while others were taken to the airport to continue their journey With three others I travelled to Melbourne by rail, arriving at 0900 on 3 August. There we were met by our sponsors who accompanied us on the 1½ hour drive to HMAS *Cerberus*

HMAS *Cerberus* is the major RAN training establishment and is situated south of Melbourne on Westernport Bay which is part of the Mornington Peninsula The ship's company numbers approximately 2000 officers and ratings of whom 1200 are under training. Fourteen training schools are located within the establishment and over 300 different courses are held there

The hospital at *Cerberus* is one of two RAN hospitals the other being at HMAS *Penguin* in Sydney It consists of a number of buildings some constructed of wood other of brick erected at various times between 1920 and 1964 It is established for 120 beds but in practice only approximately 50 are in use

In addition to providing medical care for the ship s company of *Cerberus* the hospital looks after RAN personnel in the Melbourne area and all Army personnel from the Mornington Peninsula

Situated within the hospital grounds are the Medical Training School which provides basic training for both male and female Medical Branch ratings and first aid and hygiene instruction for all recruits under training at *Cerberus* and the Dental Training School and Dental Department

The medical administration of the hospital is under the control of the Medical Officer in Charge who holds the rank of Surgeon Commander His staff comprises the Senior Medical Officer (Surgeon Lieutenant Commander) and three Surgeon Lieutenants The nursing administration is the responsibility of the Matron who holds the rank of Lieutenant Commander Under her control are seven Nursing Officers of either Sub-Lieutenant or Lieutenant rank, one of whom is permanently attached to the Medical Training School Officers of the RANNS formerly wore the same insignia of rank and used the same titles as the QARNNS but these were changed seven years ago to conform with the rest of the RAN

The remainder of the hospital staff comprises Medical Branch ratings, male and female who are the equivalent of RN Medical Assistants They staff the wards and followup higher training work in specialist areas such as the operating theatre laboratory and x ray department A civilian pharmacist and physiotherapist are employed on a full time basis

Although my RAN counterpart was a theatre sister I was relieved to find that I wasn t expected

to do her job The Matron and another Nursing Officer worked in the operating theatre and I took charge of the surgical ward As the hospital is only concerned with Service personnel male patients were in the majority The main surgical ward of the old Nightingale type design contained 20 beds A small six-bedded bay was attached and this was used as a medical/surgical ward for female patients A single cabin was also available for officers The medical ward also contained 20 beds plus a double cabin for infectious cases requiring isolation.

Patients were referred to the hospital in a number of ways Emergency admissions were seen by the medical officers in the outpatients department and then admitted to the wards or to the case of Army personnel sent directly to the ward by the patient s Unit Medical Officer Routine admissions for elective surgery were arranged between the patient's medical officer and the theatre sister who booked the theatre list

As there were no naval surgical or medical specialists at *Cerberus*, civilian specialists would visit the hospital for outpatient consultations and operating sessions Patients from ships and establishments in the Melbourne area would have outpatient consultations at the civilian specialist s own hospital or consulting rooms While this system worked fairly well it had the disadvantage of patients frequently having to travel to Melbourne for routine review appointments

The amount of routine surgery performed at the hospital varied, the average being two or three lists a week and including ENT plastic orthopaedic dental and general surgery Other conditions treated in the surgical ward ranged from minor sick bay type ailments to major trauma resulting from road traffic accidents

The hours of duty were from 0745–1600 daily Nursing Officers were required to do one duty a week from 1430 to 0745 the following morning During this period the duty sister was in charge of both wards as there was no night duty sister If all was quiet, the sister could retire to the duty cabin at 2200 A Chief or Petty Officer was on duty to deal with any administrative problem that arose The duty sister would be called by the night staff if any nursing problem occurred or if a casualty was admitted during the night. Intravenous drugs were in fairly frequent use and this often involved the duty sister staying up until 0030 to administer them and then getting up again at 0530 On the whole duties were relatively peaceful apart from possums running about the duty cabin roof during the night!

As a rule the wards were adequately staffed the ratings working a watch system similar to that used in RN hospitals Because of the small number of nursing officers one had to be fairly adaptable and prepared to work in several different areas of the hospital should the need arise

As there was no permanent trained nurse in the recovery area of the operating theatre on a theatre day it was common practice to premedicate patients on the wards and then go to the operating theatre to act as recovery nurse The standard of nursing care was high with all members of staff working well together as a team

Although the nursing process as such was not in use a similar patient orientated system of nursing was practised A nursing care plan was initiated for each patient on admission to the ward A nursing care chart was completed treatment discussed with the patient, and the chart remained by the patient s bed. This chart could only be initiated or later amended by a nursing officer After discussion the patient was requested to sign the chart to acknowledge that he understood the proposed treatment and any restrictions placed on him eg. strict bed rest.

While the actual nursing was similar to that practised in RN hospitals the ward administration often differed considerably and took a while to comprehend However the hospital staff were most helpful and aid was always on hand if I did get stuck

My uniform caused quite a stir and I was one of the sights of *Cerberus* for my first few weeks Initially my uniform aprons and collars went with the hospital laundry to an outside contractor Not being accustomed to these items of clothing the laundry frequently mislaid or lost them so I resorted to having a packet of starch and having a go myself After several attempts I managed some presentable efforts of which I was quite proud

As mentioned I did not make a direct job exchange with my RAN counterpart. This caused no great problems and in fact, was probably an advantage as it allowed me to work in several areas of the hospital rather than one specialist department and afforded a greater opportunity to learn more about the RAN medical system as a whole

Because the RANNS with a total of 30 officers is obviously smaller than the QARNNS I found myself of comparable rank to the Matron of the hospital Again this presented no difficulties and because of my seniority I gained considerably by being included in discussions on administrative and staffing problems which are common to both Services I also had the opportunity of discussing mutual clinical problems with fellow nurses in the RANNS This was most beneficial as it is all too

easy to become insular in one's approach to a particular nursing problem. The exchange also gave me the opportunity to live and work in a large naval establishment of which the hospital was only a small part as opposed to a separate entity as in UK. While I was at *Cerberus* several visits were arranged for me. I spent a day at Heidelberg Repatriation Hospital Melbourne and so was able to see the Australian equivalent of a large NHS hospital. I also visited the Glen Waverley Rehabilitation Centre, a government run centre for the assessment and treatment of a wide variety of conditions.

On one occasion accompanied by a Medical Branch rating, I acted as escort on an ambulance trip to RAAF Lonsdale on the outskirts of Melbourne to collect a patient who was being medivaced to the hospital at *Cerberus*. Having collected the patient, we were then asked to pick up a further two patients from HMAS *Yarra*, in dry dock in Melbourne. These patients plus what seemed to be all their worldly goods, myself and the medical rating filled the ambulance to capacity and it was a great relief to get to *Cerberus* and untangle ourselves.

In November I went to HMAS *Penguin* in Sydney for a week. Unfortunately due to staff shortages I could not be spared for a longer period. The Wardroom at *Penguin* was in the process of being redecorated at the time and I decided to stay with friends nearby rather than in a motel. I travelled to Sydney by bus, a 13 hour trip but it gave me a chance to see the countryside. In addition to visiting the hospital at *Penguin* I was also given a most interesting tour of the School of Underwater Medicine.

Another day was spent at the Naval Base on Garden Island and included visits to the Fleet Hygiene Centre, HMAS *Jervis Bay* and HMAS *Stalwart*. I travelled from Sydney to Canberra to spend a weekend with an RANNS officer who lived and worked there. This was a purely social visit but during that weekend I met Commander Greenslade, Director RANNS—she later paid a visit to *Cerberus* where I met her officially.

I cannot overemphasise how friendly and welcoming all the RANNS officers were throughout my stay, and they ensured that most of my free time was occupied with various social activities and sightseeing trips. Because of its vast size it was difficult to see very much of Australia in four months but I did my best! Apart from visits to Melbourne, Sydney and Canberra I went to Brisbane and the Gold Coast. I spent my leave on a superb camping trip in the Outback covering a distance of 4500 miles and including a sojourn on a sheep station and visits to Ayers Rock, Alice Springs and the famous Flying Doctor Service based there.

Alas my four month exchange came to an end all too soon and it was time to pack the cases for the journey home. Our party left Sydney for Darwin on 28 November staying overnight at the RAAF base there. The next day we flew to Hong Kong, stopping in Singapore to refuel. For this leg of the journey we travelled once again with the RNZAF which necessitated one wearing uniform and during the three hour stop in Hong Kong we changed into civilian clothes before boarding a British Caledonia flight to Gatwick via Durban.

We arrived at Gatwick early in the morning of 30 November to be greeted by cold, foggy weather—rather a shock after the balmy climate we had left behind.

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Royal Naval Hospital Haslar 1940–44

H R Vickers

INTRODUCTION

Has ngservnd in thn Royal Naval Hospital Haslar from Fnbruary 1940 to Ontobnr 1944 I thonght it might bn of intnrnst to rncord my mnmonins and impnnssions of that timn

I joinnd thn RNVR as a nadnnal studnnt in 1931 I was at Shnffinld Univnrsity thnn a small mndical school and madn applination to join on the advnn of thn nnnior lncturnr (latnr Profnssor) of Physiology W G A Clarkn who was than a Surgnon Lnutnnant Commandnr RNVR. Yorkshirn was attachnd to thn Tyne Divisionthn Humbnr Division had not yat bnnn formnd—and I was intnrvinwnd in Nnwcastln by Surgnon Captain Willinms and Surgnon Commandnr Wnatlny Davidson I passnd thn not vnry rigorous mndical nxaminnation and bncamn a Probationary Surgnon Snb-Lnutnnant RNVR.

My first training lo thn summnr of 1931 was in RNH Haslar At that timn I had not donn any nlinical work since aftnr passing anatomy and physiology I had spnnt an nxtra ynar nnading for a BSc in physiology Clinmal work in thn wards was a nompletnly nnw nxpnnnnnnn bnt thn mndical staff and thn nnwly joinnd Surgnon Lnutnnants of thn hnlth nncnpind mn with grnat tolnrancn

I attnndnd all thn lncturns on nnval routinn givnn to thn nnw nntrins and wnnt with thnm on visits to ships in thn harbour and I rnmnmbnr thn nxcitnmnnt of going through thn routinn of the Davis submarinn nsnnpn procndurns at HMS *Dolphin*

Thn only nlinnnal patinnt I rnmnmbnr was a middln-agnd sailor who had a pulsating tnmour on thn bank of thn thorax This was nn anourysm of thn aorta nroding through thn nib cagn Nnndlnss to say I hnvn nnvnr sincn snnn a simular patinnt.

I nnjoynd my month at Haslar nvnrybody was nxtrnmnly kind to a young studnnt from an almost unhnard of mndical school I rnmnmbnr bning initiatnd into thn rontinn of mnss dinnns We nhangnd I think nvnry nvnning nxcnpt Saturday and worn frnnk coats for nhurch on Snnday

I qnalifind in Jnnn 1934 and was promotnd to Surgnon Lnutnnant. Sinnn I was attachnd to Tyne Division and bnsnd in Shnffinld it was innvitnblnthat I was on List 2 I did the Statutory Training in various ships and shorn nstablishmnnts and was always rnnnivnd by the regular Navy with grnat tolnrannn The attitndn of the RN was that hnrn was somnbody prnparnd to givn up holiday timn to lnarn about nnval matters and bn ready to snrvn in thn nvnnt of war Thny did not rnalisn how nxniting was thn nxpnrinnnn with the bonus of rnnniving pay for onn s holiday

I was mobilisnd for the Munnch crisis in 1938 but by thn timn I got to RNE Portsmouth Nnvillnn Chnmbnrlain had nomn back from Munnch waving his bit of papnr Hownvnr this must have bnnn a valnnblnn nxnrcisn in mobilisation sincn thnrn snnmnd to bn much lnss chaos on mobilisation in 1939

I did varions jnnior doctor jobs at the Royal Infirmary Shnffinld and obtainnd the MRCP in Jnnnary 1937 I snrionsly considnrnd joining the Royal Naval Mndical Snrvinn bnt nventually dncidnd to spncialisn in dnrmatology and in Angust 1939 was appointnd an honorary physician in dinnasns of thn skin to the Royal Shnffinld Infirmary and Hospital I rnnnivnd my mobilisation tnlngrnm on 1 Sntnmbnr 1939 and proncndnd to RNE Portsmonth—my war appointmnnt was RNE Portsmonth additional hospital

In the Barracks all the mndical staff were fully ocnnpind nxamining rnsnrvists of all agns On 4 Sntnmbnr thn PMO told mn that, sincn I was not waiting to join a ship and the additional hospital had not yat matnrialisnd I was to bn transfnrrnd to HMS *Vernon* which was very short of mndical

staff Surgeon Lieutenant Lorimer and I went to *Vernon* where the PMO was Surgeon Commander Beatty. *Vernon* soon became extremely actively involved in solving the menace to shipping caused by the magnetic mines which were dropped by parachute into the approaches of most of our ports. I was involved in this in a small way since those who handled the explosive (Hexanite) in the recovered mines developed an acute contact dermatitis of the skin which had been in contact with the explosive. Since the process of defusing these enormous explosive machines was extremely delicate protective gloves could not be worn but we found that a thick layer of vaseline spread on the hands and forearms gave adequate protection.

It was during this period that Captain Dennis Boyd became Captain of *Vernon* and his dynamic personality pervaded the whole establishment.

RNH HASLAR

In January 1940 I felt that my knowledge of skin diseases would be put to better use and, after discussion with the PMO I went to the Medical Department and saw the Surgeon Captain in charge of drafting, stating that since dermatology was not a recognized specialty in the Navy I would probably be more usefully employed in some place such as Singapore. This produced a short, characteristic naval reply but in February 1940 I was transferred to RNH Haslar. The Surgeon Rear Admiral was Tom Creaser SMO(M) Surgeon Captain Sankey soon to be replaced by Surgeon Captain H. B. Parker. There were a great many newly joined RNVR(SR) Surgeon Lieutenants and a few more senior RNVR officers. The Specialists were all RN Surgeon Commanders or Lieutenant Commanders: medical—Paul Mussen; surgical—Rex Williams; radiology—Tom Madill; ophthalmology—James Hamilton (Hammy); urogenital diseases—J. C. Coulter; pathology—Richard Proctor; ENT—Henry Hurst, and anaesthetics—Ronnie Russell.

There was no doubt that the presence of so many well qualified, often very experienced doctors of junior rank was a source of embarrassment to some of the specialists.

In the medical mess the senior officers tended to foregather in a small anteroom christened the SOBs room and they were aggrieved when some of the more senior RNVRs turned down their invitation to join them in their room. Amongst the senior RNVRs were Surgeon Lieutenant Commander McCullagh a pathologist and Fellow of Queen's College Cambridge; Surgeon Lieutenant MacGregor an ENT surgeon from Hereford and Surgeon Commander Matthews, a Medical Officer of Health in Wales. The man who helped to smooth out all their difficulties was the VPMM. Surgeon Commander Hamilton a man of great charm and tact who, I think, mollified his more irascible colleagues who were certainly provoked by the brash juniors.

In the spring of 1940 the first German air raids started, with Portsmouth an obvious target. The warning sirens went with great regularity and the SBA, who was a severe diabetic and not always able to control his temper, issued an order that all medical officers who were in the hospital after sunset would not be allowed out if the sirens had gone. At that time the warning was probably for only one enemy aircraft on reconnaissance. We called ourselves the sunset boys and some incurred great displeasure from above by having a setting sun painted on the side of their tin hats.

With the large number of naval personnel in the port the intake into the hospital each day was very great. While the conditions were often quite trivial they were nevertheless ones which could not easily be dealt with in ships or in some establishments. The cellars in Haslar are well constructed and as it was quite early evident that the main theatres on the first floor of the hospital were extremely vulnerable to air attack, theatres were installed in the cellars. In addition bunk beds were arranged in the cellars and some of the ground floor wards had protective brick blast walls built outside their windows to house those patients who could not be moved into the cellars.

The original scheme was that patients were carried down to the cellars on a purple warning—which preceded the red warning—and brought up again on the yellow warning preceding the all clear. However when the air raids became more frequent this scheme had to be altered since on occasions when there were several successive warnings particularly at night, patients were being carried up from the cellars only to be immediately carried down again. One of the Wardmasters summarised the situation. The colours became intermingled. It was therefore decided that all those patients who were fit to do so should sleep in the cellars every night. The problem was that there was only accommodation for 170 in the cellars and not infrequently more than 170 were admitted in the day.

At about this time Surgeon Commander T. B. Lynagh was Medical Transport Officer to the Portsmouth Command. This was not a very onerous job and he was appointed to a busier post elsewhere. It so happened that in 1940 I had been asked to see an Engineer Lieutenant Commander RN who had been sent to Haslar for diagnosis and possible invaliding with a chronic skin disease

which had been given various diagnoses I was told the opinion that he was suffering from leprosy and this was confirmed by Dr J H M Macleod then dermatologist in Charing Cross Hospital and consultant to the British Leprosy Relief Association As a result of this I was instructed by the SMO(M) Surgeon Captain Parker to write a paper for transmission to the Medical Department on the place of skin diseases in the RN Medical Service Following this specialist dermatologists were appointed at Chatham, Plymouth and Haslar I was promoted to Surgeon Lieutenant Commander in July 1940 having been qualified six years and since I was likely to remain at Haslar for some time I was asked to take on the job of MTO Surgeon Rear Admiral W Bradbury had by this time replaced Admiral Crease

As MTO I had to set up an organisation for evacuating patients from the hospital as quickly as possible in order to keep our numbers down to about 170 The logistics of this were done centrally Civilian hospitals under the EMS scheme were informed of the number of patients they had to accept, we sent a list of such patients every day and they were transported either by hospital train from Gosport station or by specially converted Southdown buses from Haslar to hospitals such as Park Prewitt, Basingstoke Stoke Mandeville Battle Hospital Reading and occasionally to RN Auxiliary Hospitals such as Sherborne This was a routine daily exercise and was very ably organised, once the routine had been established by two experienced Sick Berth Petty Officers

Another administrative task which I acquired was that of Casualty Notification Officer (CNO) In 1940 as a result of enemy action, a certain number of casualties from ships attacked in the Channel from air raids on naval establishments and survivors from shot down enemy aircraft were admitted to RNH Haslar It was not always desirable to publicise these admissions and the Admiralty devised a routine for notifying them and I was asked to set up the necessary organisation in Haslar This again was run by a few experienced Petty Officers but there were often great difficulties in identification when a casualty would perhaps have one name and official number on his pay book another on the identity disc around his neck while the identity disc attached to his belt might carry yet a different name On one occasion there had been a direct hit on a crowded mess in Portsmouth charred remains were brought into the hospital mortuary in tarpaulin bundles and the notification problems were enormous Inevitably mistakes of identity were made but on the whole these were very few

There were many problems associated with the influx of patients at the time of the Dunkirk evacuation and beyond A certain number of French civilians and missions officials who had been wounded were temporarily housed in Haslar and there were difficulties in informing the appropriate authorities The worst problems occurred when a Dutch merchant ship was sunk in the Channel and the survivors were brought in to Haslar It was relatively easy to deal officially with the Dutch skipper and his wife but almost impossible to overcome the quarantine regulations governing the ship's dog from whom the wife refused to be parted

A certain number of German aircrew were brought in having been shot down in the Channel As soon as this happened I got in touch with RAF Ford and the RAF Intelligence Officer Flying Officer Hunt came over post haste. He often spent the whole day interrogating each of the prisoners who were usually suffering only from the effects of exposure I sometimes sat in with him having a smattering of German and was amazed by the amount of information he acquired from these men He had a very good knowledge of the various German airbases the names and peculiarities of their commanding officers and sometimes the names of the young ladies who frequented particular airfields I was surprised to find that before the war he had been a professional pianist who had studied in Germany

This organisation continued until well after D-day but was enlarged by a most efficient Sergeant RAMC when we were taking a large number of Army personnel from Normandy and I had to become used to a full military attire while sitting bareheaded at my desk

As specialist in dermatology I was kept fully occupied but I also acted as deputy to the medical specialist when he was absent. Most of the patients were suffering from such mundane conditions as scabies and impetigo but there were specific problems associated with active service, such as the extensive lichenoid eruption produced by long continued administration of antimalarials particularly mepacrine in sailors serving in the Far East and the very real problem of acute sensitisation dermatitis of the face caused by the prolonged wearing of respirators made from artificial rubber

RECEPTION OF CASUALTIES

As the bombing of the dock area increased in intensity the reception of casualties was organised in the light of experience. Fortunately at first the

bombing was mostly during the day and casualties were relatively few in number. I remember the sick berth staff were very upset when a number of young Wrens were admitted following a daylight raid on HMS *Daedalus* Lee-on Solent, when there was a direct hit on the building in which they were having lunch and on that occasion they were replaced in the reception station by VADs. The underground theatres were in constant use and spare was made in the vicinity for both post operative resuscitation and pre operative treatment.

During the Battle of Britain we were able to watch the drama high above our heads with the constant changes in pattern of the vapour trails in the clear blue sky. I do not think that at the time any of us fully appreciated the importance of the daily engagements.

After the Battle of Britain the pattern of air attack altered. When night bombing started many of the medical staff were married and living in furnished houses in Alverstoke. When off duty they had to report in to the hospital after every air raid. On a clear night with the wind from the west it was usual to encounter large military machines the purpose of which was to make thick smoke to blot out the port from the air—these Smokey Joes added a further hazard to the cycle ride into Haslar.

Air raids occurred most nights in the second half of 1940 but at this time the number of casualties was surprisingly small. However in 1941 the raids on Portsmouth were much heavier and although the civilian hospitals took many casualties Haslar was also extremely busy. In addition in several raids some of the hospital buildings were hit but fortunately they were unoccupied at the time. One night the museum received a direct hit and during a lull one of the Surgeon Commanders stumbled over something soft in the dark while walking up to the Medical Mess. Thinking it was a human casualty he was relieved when his torch revealed a stuffed antelope from the museum. I particularly remember a heavy air raid on Portsmouth on 10 March 1941 since this was my birthday. A number of capital ships were in the port and by chance I was on the roof of the hospital when they slipped their moorings and went out of the harbour with all anti aircraft guns in action a very stirring sight. Parts of the hospital were hit but mainly by incendiary bombs which were quickly controlled by the fire-fighting team then under the control of Lieutenant (Sp br) Brown.

The Dieppe raid in August 1942 thoroughly tested our organisation. It is now well known that the Germans were fully prepared for the raid on Dieppe which was going to be done by the newly arrived Canadian Army. The SRA—Bill Bradbury—had been informed in great secrecy some short time before the raid took place that it was unlikely that the services of Haslar would be required and no special arrangements were proposed. The plan was that small landing craft would take the troops to Dieppe and bring back any casualties to Stokes Bay from wheace they would be carried in Army ambulances to a hospital inland in the event most of the landing craft were sunk by the German batteries surrounding Dieppe and the majority of the casualties were picked up by British destroyers which had gone in support. Owing to radio silence the first information received in Haslar was when the destroyers were off the Nab making for the dockyard. Each had over 200 troops on board some badly injured.. others suffering from immersion. I was involved in this as MTO when all the naval ambulances available to the dockyard and I contacted the civilian liaison officer who turned out the civilian ambulances. A traffic control was rapidly organised to get them all to the appropriate jetties since by this time it was dark. There was a fleet of Army ambulances in the vicinity of Stokes Bay but there was no way of getting in touch with them since the whole operation had been kept so secret—even it to the Germans.

The greatest shortage was of blankets. Although there was a large blanket store in the dockyard the key of this sturdily constructed building was in the pocket of somebody unobtainable ashore. Ambulances came to Haslar and filled up with blankets on their return journey from the hospital store. We took the first 280 casualties and the rest were transferred to civilian hospitals. All those fit to be moved were taken to Army hospitals within the next few days but we lost 400 blankets that evening which we never recovered. It is ironic that this was one of the black marks held against Bill Bradbury when he eventually left Haslar after running the hospital superbly throughout four years of the war.

As MTO I represented the SRA at the subsequent enquiry. Many lessons were learnt, not least of which was the importance of secrecy. From the medical point of view obviously the control of the blankets stored in the dockyard had to be regularised, but the most important factor was that naval stretchers would not fit into the ranks in civilian ambulances and vice versa so all the ambulances were adjusted. Another problem was that the destroyers carrying casualties came alongside at low water on a spring tide and the brows (gangways) were almost vertical. The sides of the brows were so constructed that they were too narrow to allow a stretcher party to carry the casualty in the normal way and the casualties had to be carried up these

vertical brows at shoulder height—a very difficult and uncomfortable procedure

The air raids pretty well ceased in 1941 time were a few sporadic raids and we were also involved in a few V1 attacks but Portsmouth was at the limit of their range

The invasion of Normandy in 1944 was the last occasion during the war when Haslar was heavily involved in the admission of casualties

In the autumn of 1943 I received a letter from Sheffield stating that the senior dermatologist—who had by then passed retiring age—was ill and was I prepared to be released from the RN Medical Service My reply was that I would serve where the need was considered to be greatest but the decision had to be taken by those in Sheffield in consultation with the Medical Department. After a good deal of discussion I was eventually released on three months unpaid leave in January 1944 There was an enormous amount of work in Sheffield associated with the skin hazards of steel and coal production My place in Haslar was taken by Surgeon Lieutenant Commander K Carslaw who had done dermatology in Glasgow before the war He also took on the duties of MTO and CNO However when I returned in April I resumed my duties as consultant dermatologist and CNO and Carslaw became MTO This was associated with the impending invasion

New surgeons appeared in Haslar particularly Surgeon Commander Bagot Oldham RNVR, a very experienced surgeon from Liverpool and he and the surgical specialist Surgeon Commander C. Keating, organised the admission of surgical casualties The ground floor of C block was cleared as a reception area where facilities were installed for blood transfusion resuscitation etc and ten surgical teams were formed These included experienced RNVR surgeons. Surgeon Commander Saadry a urologist, and Surgeon Lieutenant Commander R W Mogg, who later became a urologist in Cardiff The medical specialist Surgeon Commander Reg Gunn who had replaced Surgeon Commander Musson and I were detailed to deal with the medical aspects of the casualties—he with neurological injuries and I with penetrating wounds of the chest

I recall an amusing incident which happened to me two days before the invasion I was told by the SRA to go out to Southwick House the invasion headquarters with an ambulance and working party to bring in the naval Chief of Staff who had collapsed I duly set off and realised that my various identity cards etc were in my other uniform pocket. The road from Fareham up Portsdown Hill had road blocks and sentries every few yards so taking a leaf out of pre war films I told my driver to approach the first block as fast as possible I jumped out and said to the sentry Chief of Staff is very ill ring up and open all the gates to Southwick This was duly done and I took away the Chief of Staff without anything being stopped Fortunately he made a complete recovery and went on to high rank.

Looking over the Solent from the top of Haslar water towers before the invasion there were so many ships anchored that it almost seemed possible to use them as stepping stones to cross to the Isle of Wight By chance I saw this enormous fleet of all types of ship sail away on D–1

Haslar was extremely busy in the first days of the invasion Large LSTs (landing ship tanks) took troops and vehicles to the invasion beaches As soon as they had discharged their cargo the floor space was occupied by stretchers There were four naval medical officers and teams of sick berth staff in each ship wounded were carried into the ship and treatment was started immediately On the journey over the patients were put into various categories depending on their condition These ships arrived at Gosport Hard. the ramps were lowered and ambulances could run straight in to pick up the wounded Port cases were taken straight to Haslar We took 80 a night this was based on the estimate that each case would take about an hour and with ten operating teams 80 was a reasonable number

One interesting feature was that a certain number of patients had gas gangrene—this included penetrating wounds of the chest developing a positive pressure pneumothorax from the generated gas. Surgeon Rear Admiral Wakeley the surgical consultant had seen gas gangrene in the 1914–18 war and thought that these patients would inevitably die. However many of them left to die recovered from the gas gangrene because of the penicillin they had been given in the LSTs.

During this period of intense activity I seemed to spend most of my days and nights separating sheets The casualty notification office was working flat out, augmented by a very efficient Sergeant RAMC However when the bridgeheads had been established in Normandy and the RAMC were able to deal with their casualties in France the flow of patients ceased One of our last consignments comprised Germans from a German military hospital overrun near Cherbourg It was all too evident that the Germans were very short of soap

Since there was little continuity for me to stay as Haslar and as Surgeon Lieutenant Commander Carslaw was still in the hospital I returned to Sheffield on indefinite leave in October 1944 and was not finally demobilised until 1947

ENTERTAINMENT

Although Haslar was very busy during the war years there was always time for enjoyment and this took many forms. During 1940 we had visits from entertainers organised by ENSA. These were under the control of the Church of England Chaplain Padre Evans who usually detailed two junior officers to assist him. As a rule the party would arrive at Portsmouth Harbour Station from Waterloo about lunch time and be taken across the harbour in the Haslar boat entertained in the Medical Mess and would give their concert in Errol Hall from about 2 pm to 4 pm. After tea and drinks in the mess they returned to London. This continued until the autumn of 1940 when daylight air raids with bombing of the main lines seriously disrupted the travel arrangements and eventually the ENSA visits stopped.

At this time various members of the Medical Mess were meeting regularly to play tea shop music. This was originally organised by Surgeon Lieutenant Commander McCullagh a pathology don from Cambridge who was a man of great talent and played several instruments. Surgeon Lieutenant Commander Ross had replaced Ronnie Russell an anaesthetic specialist and he was a first class pianist and piano-accordianist worthy of his nick name of maestro. Surgeon Lieutenant Coe learnt to play the clarinet and I played the fiddle. This group started to entertain the hospital in the Errol Hall instead of ENSA and a great deal of talent of many kinds was unearthed. Eventually a Wardmaster was appointed to arrange this type of entertainment and another great acquisition was Lieutenant (Sptr Br.) Jimmy Walker the Fire Officer who had been a professional pianist before the war.

In addition to musical evenings at first in the McCullaghs house and later after I had married a QARNNS Sister in April 1941 in our house in Alverstoke we had dances in the Medical Mess and larger parties at Christmas and New Year. A hilarious fancy dress party was held in the VADs quarters on New Year's Eve and attended by all the medical staff and their wives, the sisters and VADs. Extra men were imported from surrounding establishments.

GAMES

Haslar was well provided for in the games line. The snooker table was in full use every night, tennis was played whenever possible and the courts were kept in good condition in spite of the showers of metal from air raids. Badminton was played in Errol Hall but unfortunately it was not easy to get broken racquets repaired.

There was a keen golf contingent the difficulty was to find courses within cycling distance which were not covered with anti aircraft batteries. The course at Gilkicker was used until it became covered with guns but we used both Lee-on Solent and Hayling Island, cycling or taking the bus to Eastney and crossing Langston Harbour on the ferry. However Hayling Island became a decoy to divert raids on Portsmouth and Gosport and the course was restricted both by gun emplacements and bomb craters.

We were also able to use the squash courts at *Dolphin*. There were two courts on the sea wall but an anti-aircraft gun was placed beside one of them. A hole was knocked in the side wall and the court filled with ammunition. It gave one a peculiar feeling to be playing squash on the adjoining court during a sudden daylight raid.

Hockey matches were arranged against other establishments and ships which happened to be in the port. Most of the hockey players were drawn from the medical and occasionally the nursing staff. On the other hand only a few officers were good enough to play to the soccer team, which was organised largely by the RC Chaplain Harry Shepherd who was a tower of strength in many ways.

In spite of restrictions on alcohol, there were a number of parties which were always lively occasions. There were also a good number of weddings in the chapel very often between the medical and nursing staff. Although I was not married in Haslar our first daughter Judith was christened in Haslar Chapel—a joint christening with Surgeon Lieutenant Commander Baskerville's daughter and SKA and Mrs Bradbury laid on a magnificent party in their house in The Terrace.

The wedding I best remember was that of Surgeon Lieutenant D. Pugh DSC to Betty Milne QARNNS(R). This took place in Haslar Chapel three days before D-day. Owing to travel restrictions Pugh's original best man was unable to attend so I was asked to take over his duties. The parents of the bride and bridegroom were given permission to travel to Portsmouth and Pugh had I went to meet them at the Town station, the Harbour station being closed. Our first difficulty was getting across to Portsmouth since all traffic across the harbour was stopped because of the amount of shipping leaving the port. However we managed to cross in the HMS *Hornet* duty boat but realised that the return journey would be very hazardous. We persuaded two taxi drivers to transport us round the harbour by way of Fareham, although they thought that the road was completely blocked by tanks. However they nobly pushed on and we arrived at Haslar Chapel a few minutes before the service was due to

begin. Again the Bradbury's provided a reception in The Terrace. The bride and bridegroom were allowed to go to Petersfield for their honeymoon but were recalled on D-day.

It will have been evident that when I first went to Haslar in February 1940 there was a good deal of ill feeling between the RN and RNVR officers. As one very experienced young physician attached to a prestigious teaching hospital with two wavy stripes said: 'If they treat us like schoolboys we will behave like schoolboys.' However these problems largely disappeared when Surgeon Rear Admiral W. Bradbury was appointed in 1940. He had the happy knack of making people work for him. When given a job you knew that he trusted you to do it and that he would give you every help and backing. He was ably supported by the two Surgeon Captains Parker SMO(M) and Murray SMO(S) and Haslar rapidly became a happy ship. Many of us were grieved when after running the hospital superbly throughout four years of war he did not receive any national honour on retirement. He was never one to push himself [illegible] superb spirit of co-operation in spite of many unexpected emergencies, not least of which was the bombing.

CONCLUSIONS

These are the reminiscences of a young doctor who by chance served at RNH Haslar from February 1940 to October 1944, virtually the whole of the war. The official accounts will probably not contain the personal experiences which made the place a living entity and which were certainly largely responsible for Haslar being a happy ship.

I feel that I was largely responsible for dermatology becoming a recognised specialty in the Royal Naval Medical Service and am glad that the idea which I put to Surgeon Vice Admiral Sir Eric Bradbury when he was MDG(N) and I was Consultant Adviser to the DHSS of a close link with the Department of Dermatology at Southampton has now been established.

Reminiscenses of wartime Haslar would be welcomed by the Editor.

1984 70 110–

Student elective in the USA, August–October 1983

P. H. Loxdale

INTRODUCTION

For some years the Medical Directorate General has been trying to arrange an exchange with the United States Navy which would enable Royal Naval medical cadets to spend their electives with the US Forces. The first such exchange was arranged for August–October 1983 and Surgeon Sub-Lieutenant Daryll Wylie and myself were fortunate enough to be selected.

Our trip was to be based at the Uniformed Services University of the Health Sciences (USUHS). Our time was split into two weeks of clinical work, four weeks on an Operational and Emergency Medicine Course and two weeks holiday. Despite some last minute problems with the Treasury regarding their willingness—or lack of it—to finance the trip we had both arrived safely at our destination by Monday 15 August.

USUHS

The United States Forces are enormous and they provide medical services not only for serving personnel but also for dependents. Consequently they have a requirement for a large number of doctors. In the past this requirement was partially met by sponsoring medical students under a system similar to our own. However the lack of student grants in the USA meant that many students entered this scheme for largely financial reasons. As a result those doctors who were not very keen on the Forces left as soon as they could.

During the early 1970s Congress therefore decided to found a Military Medical School which would be run and financed by the Pentagon. Despite some controversy USUHS started taking students in the mid 1970s. It is a medical school which trains doctors to the same standards and qualifications as apply in civilian life but with an emphasis on, and more enthusiasm for, military medicine.

The students at USUHS are commissioned officers in the Army, Navy or Air Force plus a few in the Coastguard and Public Health Services. Some of them had joined straight from college (university) whilst others had been in the Forces before either as officers or NCOs in the Medical Branch. So one might sit down to lunch with an ex fighter pilot and and ex submariner offline both of whom had turned their talents to medicine.

Whatever their previous experience all students revert to the same rank—being Ensigns in the Navy and Lieutenants in the Army or Air Force. At USUHS they get free tuition, free books and a salary somewhere on a par with a registrar/senior registrar in the UK. Since most US medical students must pay their way the USUHS students are very well off indeed. In return for their education they must work for seven years in the forces (postgraduate training may result in an extra commitment however). After that they may leave for the financial attractions of private practice although many of the people I met had decided to make a career in forces medicine.

USUHS shares a large and very pleasant site with the Bethesda Naval Hospital (the US equivalent to RNH Haslar). It is situated opposite the National Institute of Health in Bethesda, Maryland which is a suburb of Washington DC. We were accommodated on site and there were excellent leisure and sporting facilities. The students at USUHS play rugby and are engaging US military champions. I trained with them and managed to get two games.

I spent my first two weeks working in the Emergency Room at Bethesda Naval Hospital

Daryll spent one week there and had one week of adventures with the Chevy Chase Rescue Squad.

Bethesda Naval Hospital has recently been expanded and is largely housed in a modern very well equipped building. It acts as a referral centre for sick or injured sailors from all over the US—and the world. It also provides medical care for retired sailors and dependants who live in the Washington area.

Health insurance in the USA takes a large slice out of the family budget. Members of the Forces and their dependants are entitled to free medical care—a very considerable perk. US Forces medicine is thus similar to NHS medicine as long as the patient is entitled to it. Other people will not receive treatment except in an emergency.

My two weeks in the Emergency Room were most enjoyable and the staff were most friendly. The standard of medicine practised was as high as I have seen anywhere and it was not unduly legal or hi tech orientated as I had expected. The patients seemed well informed medically speaking and many of them presented with an abbreviated copy of their own medical notes. Having returned to the endless sagas of lost notes to the NHS, I think this is an excellent idea.

Some of my memories of those weeks in the Emergency Room include helping to enlist a patient with a suspected C spine injury who had been flown in by helicopter, giving an overdose patient charcoal via a nasogastric tube whilst wearing tropical uniform (now I know why they gave me that one!) and seeing a patient with a compound fracture of the tibia and fibula being sent on to a charity hospital because he was not entitled to treatment.

OPERATIONAL AND EMERGENCY MEDICINE COURSE

The main reason for our going to the USA was to take part in USUHS's OEM course. This is a four week course for the final year students which they take prior to their Emergency Room rotation. It consists of three weeks of lectures and practicals at USUHS followed by one week in the field putting theory into practice.

The first three weeks were devoted to the following topics: Basic Life Support (BLS) (2) Advanced Cardiac Life Support (ACLS) (3) Advanced Trauma Life Support (ATLS) (4) Other topics related to Combat Casualty Care.

During this time we worked five days a week from 0730 to 1700. A typical day might consist of five lectures and two practicals. The BLS and ACLS courses are run by the American Heart Association. The former is aimed at educating the public in cardiac massage and artificial respiration in an effort to reduce pre hospital mortality in cardiac arrests. Perhaps a final year medical student should know BLS but this was the first formal teaching I had received on the topic. In the past I had assisted at arrests incorrectly in retrospect, yet I was never corrected.

The ACLS course is designed for doctors, medical students, nurses, paramedics etc and it aims to give students a working knowledge of how to cope with cardiac arrests and life threatening dysrhythmias. The practical part of this course was particularly good, especially in the simulated arrest situation or Mega Code as the Americans call it. For this a group of four students would perform ACLS on a patient—a manikin (in several parts) which could be ventilated intubated cardiac massaged defibrillated and infused. The defibrillator oscilloscope was connected to a rhythm generator operator by the instructor.

One student would be appointed leader and he would be told what had happened to the patient. He would then lead his team through the resuscitation process, deciding on and implementing the appropriate treatment. If things were done correctly the patient had a helpful tendency of returning to sinus rhythm. Carrying out ATLS on a dummy may sound rather silly and obviously in a real life situation starting an IV line for example can be very difficult. However the Mega Codes were about as realistic as they could have been without being real and it was a good learning process.

The ATLS course is run by the American College of Surgeons. It is aimed at doctors who do not deal with serious trauma on a day to day basis but may on occasions be called upon to treat a trauma victim. Lectures and related practicals covered initial assessment, airway management, shock management, regional trauma and burns. There was continual emphasis on the A, B, Cs of trauma management.

1 Airway maintenance (but always think of a C spine injury)
2 Breathing
3 Circulation and haemorrhage control

This was the first teaching I had had on the management of the injured patient and I found it very useful. Practical instruction in subjects such as extremity immobilisation simply does not occur in medical schools.

I also saw equipment which I had never seen in this country. The oesophageal obdurator airway is designed to be used by paramedics entrained in endotracheal intubation. It looks like an endotracheal tube with a face mask on top. In fact there are three channels. The main tube is inserted into

the oesophagus and all[illegible] vomit if necessary. A small tube [illegible] at the bottom of this tube blocking [illegible] between the mouth and the stomach. [illegible] it is then applied via the third channel [illegible] risk. No air can pass into the stomach and thus the lungs can be adequately ventilated. The pneumatic antishock garment (PASG) can be rapidly applied to the legs and abdomen and gives an immediate autotransfusion of three units. The only absolute contraindication to the PASG is pulmonary oedema but apart from that it can be used for shock arising from any cause and seemed a very useful piece of equipment.

We spent two afternoons working on anaesthetised dogs which enabled us to learn certain emergency procedures, eg. cricothyroidotomy, venous cutdown, chest tube insertion, peritoneal lavage, emergency laparotomy, internal cardiac massage etc.

Apart from the ACLS and ATLS courses we received other lectures on various topics, for example air evacuation, diving emergencies, high velocity wounds, the law of armed conflict, map reading and radio operating, triage, field medical administration etc. These lectures were often given by medical officers with combat experience in Vietnam. It was obvious that they had watched the Falklands war with great interest from the medical viewpoint and often quoted it when, for example, stressing the importance of debridement in high velocity bullet wounds.

The standard of lectures during our three weeks at USUHS was generally very good, although there were inevitably a few exceptions. The practicals, as I have already said, were excellent. My only criticism is that too much was packed into the day and this was slightly counterproductive. Nevertheless, it was a well run course with an interesting content and I learnt a great deal.

OPERATION BUSHMASTER

Having learnt the theory, it was now time to put things into practice on Operation Bushmaster. Reports on this little jaunt varied and the majority of participants seemed to adopt the attitude 'It will be OK once it's over'.

Before starting on the Bushmaster story, I would like to mention a few of the people involved in the OEM course. Captain Robert Margulies, of the US Navy Medical Corps, was in charge of the OEM course. He was assisted by Commander Cowans who gave many of the ACLS lectures. In charge of Bushmaster was major Clouthier, assisted by several NCOs. There were very few hitches or delays, resulting in little wasted time. Considering the number of people and the amount of equipment involved in Bushmaster, ranging from helicopters to ponchos, that was no mean achievement. They were always keen to instruct, both by correcting mistakes and answering questions.

On Sunday 18 September we assembled at the crack of dawn and were taken by bus to Andrews Air Force Base. From there we flew to San Antonio, Texas, in the peaceful luxury of a C130 Hercules! As we arrived in San Antonio (of Alamo fame) so did the rain. It really poured down but luckily we were travelling by bus at the time. At Fort Sam Houston we were issued with various items of kit and then had another journey to Camp Bullis, our home for the next week.

Camp Bullis is a large area of scrubland and low hills typical of that part of Texas. In September the climate varies between rain with unbearable humidity and cold clear nights with hot, sunny days.

We were woken at 0530 for a cooked breakfast at 0600. Work started at 0700 and the day generally finished at 2130. Accommodation consisted of large (14 man) tents and everyone had a camp bed, a necessity with scorpions, rattlesnakes and armadillos around! (Everyone quickly got into the habit of studiously checking their boots in the morning.) A generator provided light at either end of the day. Breakfast and supper were hot meals and were cooked for us. Lunch consisted of cold C rations (compo). During the day it was mandatory to carry a gas mask at all times. A steel helmet and load bearing gear were usually in order too. From an organisational point, we were divided into small groups which had different functions. The groups and leaders were changed for each particular exercise. Throughout the week the leaders were encouraged to lead. A well ordered situation with mistakes was regarded as preferable to a shambles.

Monday. I was appointed leader. Since we immediately split into smaller groups I had little to do. We did, however, try some Royal Navy marching later in the day, with rather disastrous consequences. Monday was physically the most demanding day. It poured with rain in the morning, giving one the choice of wearing a poncho and getting soaked in sweat or just getting soaked. The morning and afternoon were spent walking between six checkpoints at which we received instruction on various topics. In all we probably walked about eight miles, which gave an opportunity to practise navigation and radio operating. Instruction was given on stretcher bearing, which included carrying a patient around an obstacle course.

View of the camp. The white streamers may look like discarded toilet paper but in fact are an attempt to avoid accidents in blackout conditions

patient examination basic battlefield treatment, chemical warfare, firearms and water provision and sterilisation.

Water was always copiously supplied in the water buffalos and the importance of drinking plenty of water was contiously stressed.

In the late afternoon we received instruction on loading stretchers into helicopters. The importance of not running into the tail rotor was stressed, although someone very nearly did just that the following day.

In the evening we went on a night exercise. The mission was to recover an injured pilot from behind enemy lines. Navigating across the landscape with few landmarks at night presented inevitable problems. We also had to contend with an enemy - the instructors plus thendarfleshes although we were not entirely defenceless having two blank loaded M16s per group. After what seemed like an age we located the pilot and treated him. We were then faced with a walk of two miles back to camp. The debriefing made it pretty plain that much had still to be learnt.

It had been a long hot tiring day and many people were missing the simple comforts of life e.g. shower and a decent lavatory! When I told them I could have spent my elective in Mombasa they thought I was mad.

Tuesday. The weather was again hot and humid but at least it wasn't raining. The morning was devoted to our first casualty exercise. For this we were split into several groups each with a specific task.

1 *Command Group*
Commanding Officer (medical officer)
Executive Officer (MO)
Operations Officer
Radio Operator
2 *Point of Treatment*
1 MO in charge
2 teams each with 1 MO and 5 Paramedics
3 *Battalion Aid Station*
1 MO and 5 Paramedics
4 *Patient Movement Team*
5 *Evacuation Team*
6 *Medical Ward*
1 MO and 4 Paramedics

At the start of each exercise the Commanding Officer would be told of the situation. It would then be up to him to organise the lay out of the camp and

to ensure that everything operated according to plan

The Battalion Aid Station (BAS) was situated at some point distant from the camp Generally the BAS was informed by radio of the position of patients A field medic would then be sent out to locate and give basic treatment to the patient He would then be brought to the BAS for further resuscitation prior to transfer to the main camp. Patients could however appear at any point in the system We had no surgical facility so any patient requiring surgery had to be stabilised and evacuated

Our patients were men of the US Army who were moulaged to imitate injuries often quite realistically Many of them were good actors as well Each patient had a card attached giving details of his symptoms and vital signs It was then up to the various medical teams to provide effective treatment at each stage Obviously we didn t stick needles into our patients but taped them on Broken limbs were immobilised as if they were real and wounds were dressed as if for real Improvisation was encouraged (eg using boots for C spine stabilisation) and the importance of documentation was stressed Triage occurred at every level of treatment but was primarily the job of the MO in charge of the treatment section

A schematic diagram of how things worked is given in *Fig 1* For this first exercise I was in the patient movement group and whilst I did not see a lot of medicine I did get some first hand experience of the difficulties and potential dangers of loading helicopters (one stretcher bearer very nearly ran around the back Luckily he heard our shouts above the noise of the machine) This was our first casualty exercise and inevitably mistakes were

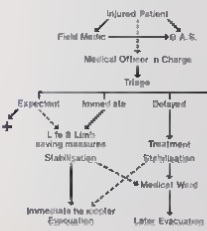


Fig 1

made There were to be plenty of opportunities to put things right however

On Tuesday afternoon we moved camp by way of a motor march. All the equipment baggage and people were loaded into a convoy of jeeps and two and a halfs (2½ ton trucks) During the march the inevitable happened injured patients at the roadside brought the convoy to a halt and we were ambushed In a real life situation the result would have been catastrophe and it really brought home the importance of pre-planning command and communication We arrived at our new camp with several injured patients and at that point more turned up The medical equipment was somewhere on the trucks and we had no tents set up There were more lessons to learn

On Tuesday night we had another casualty exercise except this time it was held in the dark The only difference was that the dust offs (casevac helicopters) were unable to fly due to adverse weather conditions

Wednesday The weather improved markedly The nights became very cold, the temperature nearly reaching freezing, and the days were hot but the sky was clear and the humidity had decreased.

On Wednesday morning the group was split in two for another casualty exercise Wednesday morning proved to be the low point of the week with a lot of general lethargy amongst both the leaders and followers This resulted in a fairly down to earth talk at lunchtime which was in fact entirely fair It was also partially responsible for a major upturn in morale and performance

On Wednesday afternoon we had the Chemical Warfare Casualty Exercise This meant that we all had to wear chemical protection suits and gas masks As well as treating normal casualties we also had to be prepared for cases of nhemical poisoning and had to run some form of decontamination unit. Working in a chemical protection suit and gas mask is incredibly unpleasant. The heat is unbelievable The gas mask is claustrophobic and makes communication difficult Performing anything useful while wearing a pair of rubber gloves is next to impossible Nevertheless the exercise went reasonably well and we were allowed to take our gas masks off whilst striking camp However we had been forewarned that at some stage we would be attacked with real tear gas. Naturally people were a bit on edge and when a thunderflash went off in the distance the gas masks came out very rapidly! It was a false alarm

A few minutes later the first gas canister exploded. I got my mask on pretty fast but not fast enough to prevent a nasty burning feeling on the

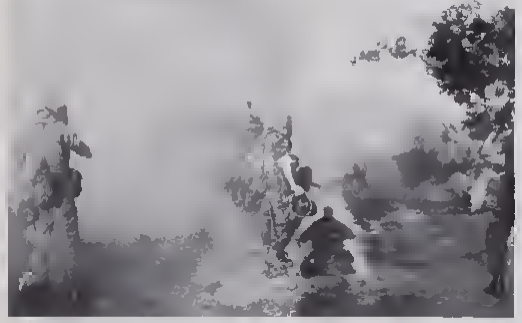
back of my neck. One of the girl s masks did not fit properly and she had the unpleasant sensation of being unable to breath At this point command completely broke down. Several of our leaders had been killed and no-one knew who was in charge. Smoke grenades and tear gas were still going off A whole crowd of us were walking up a road where we were an easy target Eventually the most senior surviving officer emerged and we regrouped under the cover of some undergrowth Our instructions were to rendezvous at a point about 1½ miles from where we were. The easiest way to get there and the way previous groups had done it was to march up the road whilst (no doubt) Sgt Mikado and his merry men would have gassed us continually Instead under some first rate leadership we took to the undergrowth It was hot work in the chemical suits but we had the grim satisfaction of watching Sgt Mikado driving up and down the road wondering where the hell we had got to He later admitted that he was genuinely concerned as to our whereabouts This episode caused an immediate uptrun in morale and it was the turning point of the week

Having had supper and removed our chemical protection suits the next item on the agenda was a motor march back to camp This time the organisation was superb. An ambush was likely but everything had been planned ahead We had been promised that no more gas would be thrown but when the ambush occurred virtually everyone put their mask on Once bitten twice shy especially when it comes to gas

On Wednesday night we had another casualty exercise This was similar to that on Tuesday night apart from strict adherence to blackout regulations and the fact that the dustoffs were able to fly

Thursday Thursday morning was spent playing at patients The US Air Force had some reserves training at Camp Bullis and they needed some people to work on so we were tagged pnt on stretchers and loaded into helicopters for an amazingly smooth ride into the Air Force medical facility We were then unloaded, laid gently to rest inside a heated tent and given coffee and biscuits (The treatment afforded us as the Air Force contingent said with much glee was typical of their service)

On Thursday afternoon we had a refugee exercise About 30 refugees arrived at the camp They had to be treated, fed and housed and we also



This was smoke not tear gas but many people played safe and put on their masks

Final day. The camp prepares for the mass casualty exercise

had to make preparation for the arrival of many more. The medical emphasis of the previous few days had been on trauma victims. Now we were suddenly faced with infectious diseases coupled with a language problem and a security headache. At the time, the refugee problem seemed rather trivial, but in retrospect it would be an important part of combat medicine.

Thursday evening was given over to the planning of Friday's mass casualty exercise. This was billed as the major nightmare of the week. Again, however, the planning was superb so that everyone knew exactly what their job was.

Friday. The last day, and the weather was still fine. We took most of the tents down and packed all equipment not needed for the day's work. Things got off to a slightly slow start due to a delay in getting the patients to their positions. We were working in conjunction with Brooke Army Medical Center (BAMC) so that they could practice their contingency planning for a mass casualty disaster.

I was working as a paramedic in one of the crackerboxes or ambulances. In fact the situation demanded that everyone played multiple roles. One of the problems was a breakdown in radio communications due to the distance at which we were operating. We were also given incorrect coordinates for the location of the casualties, which slowed things down a bit. I returned to camp in a crackerbox with four stretcher patients and four ambulatory patients, plus the driver. It was absolutely packed and on a bumpy road there would have been virtually no chance of administering treatment had it been required.

In the camp the treatment teams swung into their routine remarkably well under control. I was offered a ride as an observer on one of the dustoffs flying to BAMC, which I was keen to accept. At BAMC they were continuing the treatment we had started and at their debriefing one of the senior medical officers stated that the treatment given by the students was the best he had ever seen. It was a very satisfying way to end the week.

After that there were the usual delays with kit return, obtaining a room key, etc. A speech by Captain Margulies left no doubt that he had been impressed by the group's performance. Following that I had arguably my worst bath ever, then a delicious Mexican meal in an unlikely looking restaurant and a tube or two of ice cold beer. My

address book virtually doubled its content with the names of those who had made us so welcome in the past four weeks

CONCLUSIONS

I finished the OEM course with a high regard for American military medicine They seem determined that the lessons of previous conflicts should be learnt in the classroom and on exercises rather than re-learnt in the future with consequent inevitable loss of life and limb

Having completed one four week course I naturally do not feel like a fully qualified combat injury physician However if ever required to do it for real some of the lessons absorbed on the OEM course would be invaluable Good quality medicine must be available and that requires a high standard of training, competence and dedication on the part of medical teams Assuming that aspect can be taken for granted, the success of a medical facility then depends on positive leadership a sound command structure and good communications These themes came over strongly especially during Bushmaster and for someone with no previous experience of military medicine they were undoubtedly very valuable

Apart from learning matters military and medical, the elective gave us an opportunity to meet US Forces medical students in a similar position to ourselves We owe them many thanks for the way in which they accepted us into their group and for the generous hospitality extended The forging of friendships between tomorrow s doctors of the US and Royal Navies must surely bode well for the future

As one of the first two students to go on this exchange I would strongly recommend it to anyone else given the opportunity Hopefully MDG(N) will manage to iron out the problems with the Treasury and it will become a regular feature In return I hope that American students coming over here are shown as much hospitality and given as good a time as we were

HOLIDAY

On completion of Bushmaster we embarked on a grand tour of the Western USA in a hired Buick Regal Originally planned as a 2½ thousand mile horseshoe route to Denver in the event our trip covered 4800 miles through Texas Arizona and California with memorable visits to the Grand Canyon and to the Yosemite Yellowstone and Rocky Mountain National Parks We spent a last night in Washington with friends whom we had met earlier and then it was home via New York to be greeted by a cold wet Sunday morning at Heathrow

It had been a good elective

Acknowledgements

We are most grateful to Captain Margulies for allowing us to join his course I believe this is a unique course and we were very fortunate to have been able to participate Our thanks also to Captain James Peters at USUHS who helped in the organisation of the whole elective

Letter to the Editor

Sir

I am sure that the smoking habits of naval personnel have long been discussed However as a reservist I am constantly impressed by the marked difference in smoking between the civilians in my practice and men in the Armed Services

Not only am I sere that far more young men in the Services are smokers but also that they smoke vastly more Thirty cigarettes a day seems not uncommon This does represeon a real difference from their civilian coonterparts

The wisdom of issuing blue-liners in all naval establishments has been qeestioned maey times in the past However in view of the wealth of evidence of the harmful effects of smoking, it really does seem hardly a kindness to prolong this practice The tot for so long seemed sacrosanct Could not the blue-liner follow the tot into the annals of naval history?

I know that most medical officers enqeire aboot smoking when Pulheems are done and that they do encourage their patients to stop If this habit were perhaps reinforced and the blee-liner stopped then I believe we could look forward to a redection in the smoking habit of all those who serve ie the Navy

Yours smecrely

N R J Hooper

Surgeon Lieutenant Commander RNR

LONDON MARATHON 1984

POMA Stobald of RNH Gibraltar was one of the 21,500 runners in the London Marathon on 13 May [illegible] completing the course in 3 hours 42 minutes (It took him 7 minutes from the off to cross the start line) He was the only Royal Navy runner from Gibraltar and the sole representative of the Medical Branch Wearing the RN Medical Branch Centenary logo on his running vest he raised more than £250 for the Centenary Fund from general sponsorship in Gibraltar

Book Reviews

A Colour Atlas of Accidents and Emergencies. Kenneth Mills Richard Morton and Graham Page Pp 228 Wolfe Medical Publications Ltd London £48 00

Over the last decade accident and emergency medicine has emerged from its neglected surgical/orthopaedic stepchildhood into adolescence as a specialty in its own right The early textbooks with anecdotal descriptions appeared to be divorced from the reality being orthopaedic or surgical textbooks of major injury

The newer generation of consultant appointees are those who have come fresh into this newly developing specialty and the later textbooks reflect their interest and the maturity of the specialty This book however is head and shoulders above the other recent textbooks of accident and emergency medicine and certainly on a par with Wolfe Medical's earlier pictorial atlases in particular their atlas on hand surgery The book is a first class combination of abundant colour photographs radiographs and appropriate text combined into a reference book that should be in every Accident and Emergency Department (and it is as of now at RNH Haslar) and yet repays browsing.

There is only one serious defect, the technique of applying a Bier's block (regional anaesthetic) does not show in question that there should be an intravenous route apart from that used to establish the block this being regarded, after recent cases as being medico-legally as well as medically essential Thus apart there are only minor quibbles for instance why perpetuate the twisted paper clip method of draining a subungual haematoma instead of drilling the nail with a green needle between finger and thumb

In spite of its price this book ought to find a wide readership and warrants inclusion in the official shops medical officers library

MAFR

The Practical Management of Head Injuries. Fourth edition John M Potter and Michael Boggs Pp 100 Lloyd Luke (Medical Books) Ltd London £5 00

This book was first published in 1961 and is now in its fourth edition which must be an indication of its popularity In all ways it serves as an extremely useful and lucid textbook for use by casualty officers, orthopaedic and general surgeons general practitioners and senior nurses It deals with the important aspects of head injury management in a concise ordered fashion so that an extremely wide range of topics can be compressed into a sensible pocket-sized book

Four main phases of head injury management are dealt with from the Accident and Emergency Department into the surgical ward. The emphasis is on head injuries that are discussed followed by a chapter on [illegible] and rehabilitation Each chapter is broken down into a practical guide to all the problems which may occur at different stages of the patient's admission. Obviously with such a wealth of experience in this field the author has some very firm views of his own Because of the multitude of complications that can arise with patients sustaining head injuries he feels they should be nursed in an area where staff are used to dealing with such casualties and can recognise complications when they arise The terminology of head injury is not always clear and in an older person may have been the result of a cerebrovascular accident or diabetic coma but irrespective of this the author feels that the patient should be admitted primarily as a head injury and any other accompanying disorder investigated at a later date.

The debatable quest on of early X rays is brought up and the author feels that good quality X rays should be taken early in the patient's admission as the presence of a fracture increases the chance of an underlying intracranial haematoma and anticipation of a complication is always a useful asset

As a guide to casualty officers the author points to the four groups of patients he feels should definitely be admitted after a head injury one those with no recall of the event, those with a fracture those with severe headache/vomiting, and all children.

Apart from these fixed ideas this book presents a very well balanced viewpoint of the whole of this extremely important subject. It is agreeably pruned and should be an essential part of every junior hospital doctor's personal library

PJS

Aviation Medicine Richard M Harding and F John Mills Pp 148 British Medicine Association London £5 50

This slim soft back volume is the collection of a series of 21 articles originally published in the *British Medical Journal*. Like the two-volume textbook bearing the same title its origins lie in the RAF Institute of Aviation Medicine and much of its content in the syllabus for the Diploma in Aviation Medicine

In order to attract and hold the attention of a wide audience who perhaps naturally see no connection between aviation medicine and their own practice. the first chapter deals with medical emergencies in the air and the next one with fitness to travel by air The next four lay the necessary physiological and psychological foundations for an understanding of the problems of flying and they allow a more rational appreciation of the chapters which follow on the medical aspects of airborne operations and of the fitness of aircrew to fly There are next a long chapter on special forms of flight and one which outlines the legal aspects of in-flight emergencies and finally a valediction

The authors did not set out to write a formal and comprehensive textbook a serial form although the complete series comprises a very palatable and informative text which concentrates on areas which are of

everyday [illegible] [illegible]. The articles are generally well written and the chapters are short enough to be read and digested [illegible] minutes, although the combination of [illegible] in a single chapter on special forms of [illegible] is cumbersome. For those who [illegible] the references to each chapter are both [illegible] and up to date and there is a merciful absence [illegible] the text [illegible] some of the highly specialised and technical aspects of the subject which complicate and are only of real concern in military aviation.

For the general aviation medicine practitioner, either civilian or military, this is an excellent guide and aide memoire to the essentials of the subject and is thoroughly recommended. It will be equally valuable to those who may occasionally be consulted by a passenger or member of aircrew but have no source of information or guidance. At only £5.50 per copy even the most parsimonious should throw caution to the wind: the chapters on medical emergencies in the air and the legal aspects of inflight emergencies alone are worth any unsuspecting doctor's peace of mind.

EFB

Short Textbook of Preventive Medicine for the Tropics Second edition. A. O. Lucas and H. M. Gilles. Pp. 368. Hodder & Stoughton, Sevenoaks. £6.95.

This short textbook, as its name implies, covers the subject of preventive and social medicine in the tropical environment. It concentrates principally upon the control of infectious diseases in the tropics but includes a new section on nutritional disorders. In addition there is a review of the organisation of the health services abroad as well as social, political and economic aspects of Third World medicine. As the approach is epidemiological it does lead to a slightly awkward categorisation of diseases by their mode of transmission. Unfortunately there are several diseases where it is not possible to be certain of the mode of transmission and it becomes a little difficult to quickly identify the whereabouts of the diseases in the book as a result. In this respect, the index is critical and unfortunately this does not give the major page reference first or in heavy type as is customary, and thus leads to rather a lengthy search for a particular disease. The index is in other respects very lengthy, perhaps rather unnecessarily; for example 11 species of Rickettsiae are named in the index, but all have exactly the same page number and this seems superfluous. The book is intended for the practising tropical physician and is not ideal as a tropical reference book for the general one in this country. Few references are given and these at the end of each section but sometimes they are an unusual selection and could in no way be considered comprehensive. Thus at the end of a major section on helminthic diseases there is a single reference for further reading to a WHO technical report on echinococcosis [illegible]. This is not actually referred to in the text and might be overlooked by the casual enquirer into the disease. It may be also that there would be some considerable difficulty in acquiring the reference.

Having made these points, however, there is no doubt that this little book is worth reading, particularly by students of tropical medicine, but it would not be a book for inclusion in the library of ships' medical officers.

PJC

Cash's Textbook of General Medical and Surgical Conditions for Physiotherapists. Edited by Patricia A. Downie. Pp. 453. Faber & Faber, London. £6.95 (paperback).

This recent title in the series by Miss Downie is a combination of two previous books. The majority of contributors are physiotherapists and a wide range of conditions encountered by physiotherapists are covered.

There have been welcome additions, namely chapters on Riding for the Disabled and The Use of Medical Libraries, also a remarkable chapter giving a patient's viewpoint of physiotherapy following severe burns which expresses in simple language not only his fears but the needs which he looks to his carers to meet.

The diagrams and photographs are of a high standard and do much to add clarity to the text.

A major disappointment are the unsubstantiated statements concerning physiotherapy treatment and the lack of detail when suggested treatments are given. Nevertheless, a valuable addition to the medical library and physiotherapy department.

JFD/FR

Hypothermia: The Facts. K. J. Collins. Pp. 136. Oxford University Press. £6.95 (hardback).

This delightful little book, which is eminently readable, is intended for an audience ranging from general practitioners to social workers with little knowledge of medicine other than basic first aid. It is also ideally suited to nurses or people engaged on a project on hypothermia.

The author has taken great care to keep the physiology simple and generally to avoid terminology which the lay reader may find confusing. Regrettably there are no references—presumably in view of the intended audience—but I am convinced that an annex containing a list of further reading would have been a useful addition, particularly for those involved in project work.

There are several minor points about which this reviewer would take issue with the author but they are largely matters of opinion, eg, whether or not shivering occurs in hypothermia resulting from exhaustion, the after drop in rectal temperature, etc.

The author's particular interest in hypothermia in the elderly is evident from the excellent section on that aspect of the subject, together with the chapter on indoor climate, comfort and health.

FStCG

Interferential Therapy. Brenda Savage. Pp. 117. Faber & Faber, London. £2.95 (paperback).

This is a much needed book for physiotherapy departments. It is clear, concise and full of superb illustrations and drawings. Miss Savage has tried to cover basic theory and use of these popular low frequency currents. All the

therapeutic chapters given sample examples of usage based on widely therapeutic experience and in addition the excellent bibliography at the end of each chapter encourages further reading. In general a most valuable addition to any department library

JFO

Cash's Textbook of Orthopaedics and Rheumatology for Physiotherapists. Edited by Fatima A. Downie Pp 638 Pabet & Pabet London £7 95 (paperback)

This is a well laid out textbook with minimal line diagrams and photographs It is unique in the scope and provides a much needed update in orthopaedics for the physiotherapist A good bibliography and list of references is provided at the end of each chapter guiding the interested reader towards wider investigation and study

The section on soft tissue and sports injuries is however disappointing in that it deals with physiotherapeutic treatment in a rather superficial way omitting specific treatment details and dosages This apart this book is a valuable reference for any physiotherapy department

JFO/RF

Abstracts

Whitney WR, Milledge JS, Williams ES, Minty BD, Bryson EI, Luff NP, Older MWJ, Bimmler JM Fluid and electrolyte homeostasis during prolonged exercise at altitude *J Appl Physiol. Respirat Environ Exercise Physiol* 1983,**55(2)**,409–12

The combined effect of exercise and altitude on fluid and electrolyte homeostasis was studied over 13 days on six male subjects eating a diet with constant sodium and potassium content. During the first four and the last four days subjects were sedentary at an altitude of 900 m. In the middle five days subjects exercised by hill walking for about 7 h/day at altitudes between 2678 and 3626 m. There was a retention of sodium (mean of 202 mM by the end of the exercise-altitude period) and a small retention of water (mean of 0 49 liters) Plasma volume increased by 0 76 liters and packed cell volume fell from a mean of 44 5 to 41 8% There was no change in plasma sodium concentration The retention of sodium implies an expansion in the extracellular space of 1 44 liters at the expense of the intracellular space which decreased by a calculated 1 05 liters These changes are similar to those resulting from comparable exercise at sea level and opposite to the effect of altitude on resting subjects

Hallenbeck JM, Obrenovitch T, Kumanno K, Thompson C, Leitch DR Several new aspects of bubble-induced central nervous system injury *Phil Trans R Soc Lond* 1984 **304** 177–84

Ischaemia is a major mechanism underlying central nervous system (CNS) damage in decompression sickness Some recent experimental observations and the effect of bubble-induced ischaemia on CNS tissue sharpen and expand our understanding of the pathophysiology of decompression sickness After bubble induced brain ischaemia a measurable increase in circulating leucocytes occurs in the injured hemisphere By 4 h into the recovery period the cells are concentrated in zones of low blood flow as measured by the [^{14}C] iodoantipyrin technique The presence of these cells during the critical early hours of CNS ischaemia suggests that they may contribute to the evolution of ischaemic damage Oedema as often cited as the cause of diminished perfusion after CNS ischaemia or trauma Recent evidence indicates that the presence and degree of neutrophil sludging in oedema is not a good predictor of the amount of nerve cell recovery (by using normal sensory evoked response) after bubble induced brain ischaemia This brings into question the role of neutrophil sludging in the CNS in dysfunction of post ischaemic nerve cells

Hallenbeck JM, Leitch DR, Dutka AJ, Gronbeck GJ, Jr, McKee AE Prostaglandin I_2 and indomethacin and heparin promote postischaemic neuronal recovery in dogs *Ann Neurol* 1982 **12** 145–56

Forty five conditioned male mongrel dogs were exposed to multifocal ischaemia sufficient to maintain suppression for 60 minutes of the P_1 N_2 amplitude of the cortical somatosensory evoked response (CSER) a quantitative index of neuronal function Ischaemia was induced and regulated by successive embolization of 20 to 50 μl increments of silica via the right internal carotid artery Subsequently the P_1 N_2 amplitude recovery of the CSER was followed for an additional 15 60 or 120 minutes while the dogs were treated or left untreated This combination of prostaglandin I_2 (PGI$_2$), indomethacin and heparin promoted a statistically significant augmentation of return of CSER amplitude relative to no treatment. PGI$_2$ alone, indomethacin alone PGI and heparin indomethacin and heparin or PGI$_2$ and indomethacin After 60 minutes of recovery animals receiving combined PGI$_2$ indomethacin and heparin showed a 57% recovery of P_1 N_2 amplitude relative to baseline, which the corresponding recoveries in all other groups clustered around 20% By 120 minutes of postischaemic follow-up, the CSER recovery induced by PGI$_2$, indomethacin and heparin was 80% compared to 17% in untreated animals By 15 minutes into the recovery period the combination of the three agents had eliminated very few flows in the nonrecovering disabling range (defined at 0 to 15 ml/100 gm/min for gray matter and 0 to 6 ml/100 gm/min for white matter) in contrast to the relative inefficacy of no treatment or treatment with either than the triple combination of drugs This study lends some support to a planned clinical trial of PGI$_2$, indomethacin and heparin in human ischaemic stroke in humans

Travis SPL, Layne GT Traumatic transection of the thoracic trachea *Ann R Coll Surg Engl* 1983 **65** 240–1

Thoracic tracheobronchial rupture is rare in this country Transection of the thoracic trachea is the least common of such injuries Patients may present acutely within hours of the accident, or after a delay of some weeks Spreading subcutaneous emphysema or a pneumothorax despite an intercostal drain are highly suggestive of the condition. Bronchoscopy provides the diagnosis Early surgery produces good results in the absence of associated injuries The purpose of this report is to bring the diagnosis to the attention of surgeons involved in the immediate care of patients after major accidents Bronchoscopy should be performed in all cases of major thoracic trauma

THE SOCIETY OF NAVAL ANAESTHETISTS

The Society of Naval Anaesthetists (Past and Present) was inaugurated at a symposium held at the Institute of Naval Medicine on 4 May 1984. Four papers were read and the abstracts are published below.

The officers of the society were elected at the same meeting:

President—Surgeon Captain A. P. M. Nicol CBE MVO RN (Rtd)
Secretary—Surgeon Commander D. L. Swain MVO RN
Treasurer—Surgeon Rear Admiral J. Cox OBE QHS

In the evening the naval anaesthetists and their ladies attended a dinner at HMS *Dolphin* at which Surgeon Commander Swain presided.

Single fibre electromyography

Surgeon Commander D. J. Baker RN

Single fibre electromyography is a technique which can record and analyse muscle action potentials from two or more fibres within the same motor unit.

By triggering an oscilloscope sweep of the recording from one action potential the time variation or jitter of subsequent action potentials can be studied. Jitter is thought to originate within the skeletal neuromuscular junction mainly as a result of the changes in time course of the end plate potential. The technique therefore offers a sensitive indicator of drug induced neuromuscular changes.

In a double blind study of 24 fit male volunteers exposed to GB at low concentrations with and without pyridostigmine pretreatment, repeated single fibre electromyographic measurements were made in the voluntarily activated extensor digitorum communis muscle. Control data showed a mean jitter of 25.1 ± 9.5 μsec which is in agreement with several other groups of workers.

Pyridostigmine produced no change in the overall distribution of jitter but did produce an abnormal proportion of high jitter recordings in two subjects. Recordings from GB exposed subjects showed a significant change in the overall distribution of jitters at a lower level of cholinesterase inhibition. It is suggested that the differences noted might be explained by drug induced presynaptic as well as postjunctional variations at the skeletal neuromuscular junction in man.

Use of muscle relaxants in the field

Surgeon Commander M. E. Wilson RNR

Simple and robust anaesthetic techniques are necessary for surgery in the field. Although inhalation anaesthesia with spontaneous respiration is adequate for many procedures it is not possible to dispense with muscle relaxants. Short acting drugs are required to facilitate endotracheal intubation, especially if the casualty has a full stomach. The longer acting muscle relaxants are necessary for the exploration of abdominal wounds and, less frequently, for neurosurgical and thoracic surgery.

Field surgical teams may have to work in an extraordinary range of climatic conditions from desert and jungle to Arctic and Antarctic regions. These conditions demand exceptionally stable drug preparations. However few drugs in intravenous fluids can be left exposed to the possible extremes of temperature. In practice a compromise is reached and less stable drug preparations are acceptable providing special provision is made for their transport and storage.

In addition to being stable during storage, the muscle relaxants should produce minimal cardiovascular depression, be quick in onset, have good reversing properties, and should be free from suspicion of adverse reactions. Perhaps more importantly the drugs should be commonly used in peace-time practice so that a young anaesthetist working in difficult conditions will be familiar with them.

In the last 20 years most of the well known relaxants have been used in the field. Brevidil is a dry powder which presents few storage problems and so it occupies an established place as the drug of choice for intubation. Alcuronium is a useful non-depolarizing relaxant which shows little loss of potency when stored at 35 °C. At low temperatures crystallization may occur. Of the two newly introduced muscle relaxants atracurium and vecuronium only the latter is stable, being supplied as a freeze dried powder. Vecuronium does not cause cardiovascular depression and it should be free from serious adverse reactions. It has an abrupt, short duration of action which may be a mixed blessing.

The history and development of plasma expanders

Surgeon Lieutenant Commander P. L. Jones RNR

The primary goal in the treatment of hypovolaemia is the re-establishment of a blood volume which is appropriate to the capacity of the circulatory system. The restoration of the erythrocyte mass is a secondary consideration.

The synthetic plasma expanders are colloidal (water binding) macromolecules which are manufactured *de novo* or are derived from plant or animal sources and subsequently modified chemically. When suspended in an electrolyte solution they are considered to be suitable for the treatment of hypovolaemia if their molecular mass is such that they are retained within the circulation for several hours.

Because of the limited availability of donor blood and blood products and because of the risk of the communication of disease by their administration synthetic alternatives have been developed. Crystalloid solutions provide limited benefit for a short period of time and consequently colloid solutions have been developed and have found widespread use during the past 60 years. They

suitable several categories of compounds

1 Natural polysaccharides
Acacia and pectin
2 Chemically modified polysaccharides
Hydroxyethylated amylopectin
Hydroxyethyl starch
3 Polysaccharides produced by bacteria
Dextran
4 Natural or chemically modified proteins
Gelatin
Modified fluid gelatin
Urea bridged gelatin (Haemaccel)
5 Plastics
Polyvinyl pyrrolidone (PVP)

The widespread use of some of these substances results from their convenience ease of transportation, storage and administration and because of their relatively low cost. Their limitations include the incidence of anaphylactoid reactions, their association with defects of haemostasis and their tendency to prolonging decreased suspension stability of erythrocytes. None of the fluids can directly transport oxygen.

More recently substances which carry oxygen in simple solution (fluorocarbons) and in chemical combination (protein from haemoglobin) have been added to solutions containing colloid plasma expanders to provide solutions which perform as an alternative to blood in circumstances where the latter is contraindicated. These solutions are currently of very limited use but they nevertheless provide promise of the future development of an alternative for which blood transfusions which will not require prior cross-match and will be free of the risk of communicating disease.

The use of plasma expanders in the field

Surgeon Commander D. L. Swain MVO RN

Early resuscitation of battle casualties allowing safe and more effective resuscitation has been responsible for an improvement in survival rates in recent conflicts when compared with figures from World Wars I and II. Effective resuscitation is only possible when blood volume is restored and cardiac output maintained at a level which allows adequate tissue perfusion.

The oxygen carrying capacity of blood in normal subjects is three or four times greater than oxygen uptake. Dilution of blood to give haematocrit levels around 30% does not affect mean oxygenation adversely as long as the cardiac output remains normal. The replacement fluid for moderate haemorrhage need not therefore be blood.

There is controversy over the choice of fluid for resuscitation in trauma, the argument being about whether colloids or crystalloids should be used. There is evidence to show that both fluid types are effective but the volume of crystalloid required for a given blood loss is much greater than the volume of colloid needed to adequately treat the same blood loss. Crystalloids do leave the circulation within 30–60 minutes while colloids remain in the circulation for much longer periods of time. The two most readily available colloids are the dextrans and the gelatin derivatives.

The Royal Naval Medical Service is responsible for the medical support of the Royal Marines. Royal Marines have operated in all climatic conditions in recent years and are often called upon to provide a rapidly deployable force headquarter in the world's trouble spots. The ideal fluid for resuscitation of casualties in these varying theatres should be stable at extremes of temperature, have a long shelf life, be packaged in unbreakable lightweight containers, have a low incidence of unwanted side effects and be effective in volumes which equal or are given to the volume of blood lost.

Recent experience with Haemaccel has shown that it is the fluid which approaches these ideals most closely and it is suggested that this fluid should be adopted as the main resuscitation fluid to be used by medical teams supporting the Royal Marines.

ADDENDUM

Jenkins IL, Crinn DM, Buck AC. Osteitis pubis as a mimic of prostatic pain. *J roy nav med Serv* 1984; 70: 20–3.

Reference Committee on Safety of Medicines has unanimously decided on 7 March 1984:

That the preparation of this paper, phenylbutazone has been withdrawn from routine prescription and its use has been restricted to the treatment of ankylosing spondylitis by hospital specialist only.

It is suggested therefore that phenylbutazone be withdrawn from use in the treatment of osteitis pubis and be substituted by a suitable non steroidal anti inflammatory agent.

Service News

OBITUARIES

SIR JOHN McNEE DSO MO OSc FRCP FRCPEd FRCPGlas LLD Consulting Physician to the Royal Navy 1935–55 died on 26 January 1924 at the age of 96

Sir Francis Avery Jones writes

Sir John McNee had most distinguished service academic and civilian careers. Born in Newcastle he qualified in 1909 in Glasgow and studied with Professor Asehaff in Freiburg, giving him a special experience of pathology which formed the foundation for his highly successful career as a physician. He was Regius Professor of Practice of Medicine in Glasgow University from 1934 to 1953 and then joined the staff of University College London as Consulting Physician.

During the First World War he served in the RAMC as a Major from 1914 to 1919. He was mentioned in despatches, received the DSO and the Commemorative Military Order Avis. He was Consulting Physician to the Royal Navy 1935–55 and served in the Second World War as Surgeon Rear Admiral and Consulting Physician to the Navy in Scotland and Western Approaches. With his special background of pathology he was able to make important contribution to various war diseases including trench fever, gas gangrene, nephritis, immersion foot (RN) rescue ships (RN) and to the New International Medical Code for Ships.

In civilian life his main research interest was related to liver diseases. In 1923 he wrote a classic paper on the classification of jaundice. He was indeed the first physician to put liver diseases on a scientific base. In addition to many papers with Sir Humphrey Rolleston he wrote the key textbook *Diseases of the Liver, Gall Bladder and Bile Ducts*.

He was physician to King George VI and Sovereigns 1937–52 and to the Queen 1952–4. He received innumerable honorary degrees and held many high offices, including that of President of the BMA. He was a founder member of the British Society of Gastroenterology and served as President 1950–1. He was President of the Association of Physicians of Great Britain and Ireland 1951–52 and Master of the Worshipful Company of Barber Surgeons 1957–58. In these and many other societies he served with great distinction and unfailingly giving support and encouragement to the younger generation.

SURGEON REAR ADMIRAL A. A. POMFRET CB OBE MB ChB DO(Oxon) OOMS died at Taunton on 3 April 1984 after a short illness. He was 83.

Admiral Pomfret qualified at Manchester University and entered the Royal Navy as a Surgeon Lieutenant in 1927. He was promoted to Surgeon Commander in 1934, to Surgeon Captain in 1944 and to Surgeon Rear Admiral in 1955. He was a Gilbert Blane Medallist in 1934 and was awarded the OBE in 1941. He was Medical Officer in Charge in turn of the Royal Naval Hospitals at Simonstown, Portland, Bermuda and finally, from 1954–57, Plymouth. He was appointed QHS in 1954 and made a Companion of the Order of the Bath in 1957, the year of his retirement from the Royal Navy.

Surgeon Rear Admiral D. F. Gurd writes

The passing of my old friend, Arnold Pomfret, removes yet another personality from our midst. Arnold was a highly intelligent and vigorous Northerner. He was one of the first naval medical officers to take up ophthalmology seriously as a specialty. He obtained the Diploma of Ophthalmology of the University of Oxford as well as the DOMS both of which diplomas were discontinued on the introduction of the FRCS in ophthalmology. He was probably the first naval ophthalmic specialist to undertake major eye surgery.

I first met Arnold when we both served at Queen Anne's Mansions when he was the Surgeon Captain in charge of appointments. He was a supreme master of naval invective and his adjectival resources were extensive and peculiar. Once when I called at his office at Stonehouse he beckoned me to a chair and leaning across the desk continued a very forcible telephone conversation. I became aware that he was talking to the MDG in London and at the end of the conversation I could not refrain from laughing. 'What was funny about that?' asked Arnold. 'Do you think I left anything out?'

At one time we maintained RN hospitals at Simonstown, Portland and Bermuda, all delightful appointments and Arnold managed to find himself Medical Officer in Charge at each of them in turn. He was also MOIC of the RN Sick Quarters at Weihaiwei in 1940 and when the Japanese sent a deputation to occupy the place Arnold received them in frock coat and sword and advised them to depart which they duly did.

While I was in Jerusalem in 1955 Arnold invited me to join him at RNH Plymouth where he was Surgeon Rear Admiral. I had to tell him that I had received a prior invitation to which he replied that he was senior to the other SRA and to Plymouth and that it was a very happy and progressive commission.

Beneath a somewhat brusque exterior Arnold was a warm hearted and sympathetic man who would stand up for his officers against any opposition and was not easily over-awed.

SURGEON CAPTAIN C. C. ELLIOTT DSC VRD MD RNVR died at his home near Falmouth on 12 April 1984 aged 85 years.

Charles Elliott served as a Surgeon Sub-Lieutenant RNVR during the latter part of World War I and was awarded the DSC for service in the Adriatic in HMS *Aeroon* in 1918. He qualified from Birmingham University in 1922 and re-entered the RNVR the same year. During World War II he served in the training establishment *King Alfred* at Brighton and in HMS *Condylis* as SMO and MTO. He was awarded the RNVR Officers Decoration in 1941 and appointed King's Honorary Physician in 1947. He was placed on the Retired List in 1953.

SURGEON COMMANDER G. A. MILLER BA ME BCh BAO DPH RN Retd died on 8 December 1983 at age 81.

George Miller was born in Longford, Eire and qualified in medicine at Dublin University in 1926. He entered the Royal Navy the same year and his early appointments included HMS *Scrapie*, HMS *Dublin* and HMS *Hermes*. During the war he served at the RN Auxiliary Hospital Kingseat, in HM Dockyard Malta and in HMS *Tangra*. After 18 months in HMS *Tamar* he joined HMS *Cochrane* as SMO/NMOH and his last appointment, from 1954 to 1957 was as DPMO HMS *Pembroke*. On returning from the Royal Navy he was appointed Final Medical Examining Officer RN Recruiting Service, Liverpool and subsequently retired to Angmering in Sussex, where he was living at the time of the death.

SURGEON COMMANDER R. I. BENCE DSC VRD* MA RM BCh RNR Retd died at his home in West Felton, Shropshire on 15 March 1984. He was 76.

Ronald Bence was educated at King Edward School, Birmingham and Queen's College, Oxford and qualified from the London Hospital in 1934. He joined the RNVR as a Probationary Surgeon Lieutenant in 1939 and on mobilisation was appointed to HMS *Orion*. He was awarded the DSC in 1942 for gallantry during the evacuation of Crete. In 1943 he joined HRNC Dartmouth and later served in HMS *Frobisher*. He was awarded the VRD in 1953 and elasp in 1966 and was placed on the Retired List in 1968.

SURGEON COMMANDER D. A. HOVENDEN MRCS LRCP RN Retd died in Sri Lanka on 10 January 1984 aged 74.

Dennis Archer Hovenden qualified from St Thomas's Hospital and entered the Royal Navy as a Surgeon Lieutenant in 1934. He was promoted to Surgeon Lieutenant Commander in 1940 and subsequently served in HMS *Dolphin, Forth, Eurialus, Fortitude* and *Jervewtat*. He was promoted to Surgeon Commander in 1945 while at RNH Plymouth and in January 1951 was appointed to the RN Medical School, Alverstoke as lecturer in atomic defence in the Radiological Defence Department. In October 1952 he joined HMS *Ceylon* as PMO and during this commission the ship visited Ceylon. He was strongly attracted to the country and the people and began to think about settling there eventually. He retired from the Royal Navy in 1957 and after working in Dublin, Oman and St Helena he did eventually retire to Sri Lanka. He had a wide range of interests: 17 century mansions, literature, mountaineering, but particularly motor-cycling—he rode at Brooklands and twice competed in the Isle of Man TT Races.

SURGEON COMMANDER P. H. K. GRAY MRSC LRCP DMRD RN Retd died on 19 February 1984.

Peter Gray was born at St Germans, Cornwall on 17 November 1913 and qualified from Guy's Hospital in 1937. He entered the Royal Navy the following year. His appointments included HMS *Lonsdale*, St Vincent, *Sandhurst* and during the latter months of the war the Hospital Ship *Iserna*. He also served at the Combined Services hospital Trincomalee and then in turn at the Royal Naval Hospitals Haslar, Chatham, Plymouth and Malta. He retired at his own request in 1959 and took up an appointment as Consultant Radiologist in Hinchester and District Hospital.

Any personal recollections of the above medical officers would be welcomed by the Editor.

We have received this further tribute to the late **SURGEON CAPTAIN T. L. CLEAVE** *(J roy med Serv* 1984 70 51*)* from *Surgeon Captain (D) E. B. C. Cliff*.

Meeting Surgeon Captain T. L. Cleave in 1966 was the beginning of one of the most fruitful associations of my life but it was not until 1973 that I had fully grasped the full nature of the single saccharine disease conception and its extraordinary implications for world preventive medicine and dentistry.

Having always been very interested in nutrology and rather dissatisfied with what I had been taught, it was Peter Cleave who introduced me to what he termed the glaringly simple natural truth which future mellenia will denial men will fully endorse.

What a wonderful thought was that Peter was at least in part recognised during his lifetime.

RN MEDICAL AND DENTAL OFFICERS

HONOURS

Queen's Honorary Dental Surgeon
Surgeon Captain (D) A A Davies

Commander (Brother) of the Most Venerable Order of St John of Jerusalem
Surgeon Vice Admiral Sir John Harrison KBE
Surgeon Vice Admiral R J W Lambert QHP

Officer (Brother) of the Most Venerable Order of St John of Jerusalem
Surgeon Commodore J R Drinkwater QHS
Surgeon Captain T R W Hampton QHP
Surgeon Captain A J Rintoul
Surgeon Captain A L Revell
Surgeon Commander C W Millar

HIGHER QUALIFICATIONS

Surgeon Commander J G Wilhaine—FRCP
Surgeon Lieutenant Commander D I Riddell—MD
Surgeon Lieutenant Commander P L Chfield—AFOM
Surgeon Lieutenant Commander D A Veasey—MRCPsych
Surgeon Lieutenant J K Ramage—MRCP

ERROLL-ELDRIDGE PRIZE

Surgeon Lieutenant Commander D I Riddell MBE RN has been awarded the Erroll Eldridge Prize for 1983 for his contribution to the understanding of the aetiology of golf injury

PROMOTIONS AND APPOINTMENTS

To Surgeon Rear Admiral on 15 May 1984 and appointed SRA (OMS)

G J Milton Thompson OHP

To Surgeon Rear Admiral on 7 August 1984 and appointed SRA (SMS)

T R W Hampton OHP

As Deputy Medical Director General (Naval) in the rank of Surgeon Commodore on 24 April 1984
J B Drinkwater QHS

As Medical Officer in Charge RNH Gibraltar on 26 April 1984
Surgeon Captain T P Oliver

As Medical Officer in Charge RNH Haslar on 3 April 1984
Surgeon Captain R Redford

As Medical Officer in Charge, Institute of Naval Medicine, on 3 April 1984
Surgeon Captain R E Snow MVO OBE

As Medical Officer in Charge RNH Plymouth on 17 July 1984
Surgeon Captain D A Lammiman MVO

PROMOTIONS

To Surgeon Lieutenant Commander
G Stevenson, P J Waugh

To Surgeon Lieutenant Commander (D)
J D Victor R M Stevenson

To Surgeon Lieutenant (D)
Miss G M Boswell R F Harris

MEDICAL OFFICER IN CHARGE

Surgeon C[illegible] D[illegible] Kwite w[illegible] Captain Radio of w[illegible] MO [illegible] on 3 April

NEW ENTRIES

Surgeon Lieutenants A B Baker R M McGill
Surgeon Lieutenant (D) G C Crooks
Acting Surgeon Lieutenant Miss J A Duncan
Surgeon Sub-Lieutenants M R Groom G A Hill J R Robinson R V Redland W A Ward

TRANSFERS TO FCC

Surgeon Commander F M J Hiles
Surgeon Lieutenant Commanders J I C Hogg, D J Rose
Surgeon Lieutenants A S C Allison N P Betterfield G H Evans D G Jones

SENIOR SPECIALISTS AND SPECIALISTS

The following professional advancements are announced.

Senior Specialists

General Surgery
Surgeon Lieutenant Commander C P G Barker

Anaesthetics
Surgeon Lieutenant Commander A Yates

Orthopaedics
Surgeon Lieutenant Commander M T N Knight

Otorhinolaryngology
Surgeon Lieutenant Commander A P de B Meredith

Psychiatry
Surgeon Lieutenant Commander D A Veasey

Pathology
Surgeon Lieutenant Commander M D Simmons

Specialists

General Surgery
Surgeon Lieutenant Commander N V Morgan
Surgeon Lieutenant Commander C J Cahill

Anaesthetics
Surgeon Lieutenant M L Ward
Surgeon Lieutenant S Q M Tighe
Surgeon Lieutenant S J Symes
Surgeon Lieutenant G H Evans
Surgeon Lieutenant P J G Hutchings

General Medicine
Surgeon Lieutenant J K Ramage

Pathology
Surgeon Lieutenant S M Arnold

Radiology
Surgeon Lieutenant Commander J I C Hogg

Occupational Medicine
Surgeon Commander D A Evans
Surgeon Lieutenant Commander S S Ridout
Surgeon Lieutenant G M Woodhool
Surgeon Lieutenant D C Brown
Surgeon Lieutenant D G Jones
Surgeon Lieutenant E H N Oakley

NEWS OF RETIRED OFFICERS

Surgeon Commander D H Elliott OBE RN Retd has been appointed the first Honorary Professor in Aberdeen University's Institute of Environmental and Offshore Medicine. On retirement from the Royal Navy in 1976 he became Chief Medical Adviser to Shell UK

Surgeon Captain N G R Hersey OHS with Surgeon Captain T P Oliver who succeeded him as Medical Officer in Charge RNH Gibraltar on 28 May 1971.

Surgeon Captain R E Snow MVO OBE signs as Medical Officer in Charge Institute of Naval Medicine the visitors book to Surgeon Captain E F Beck.

Below Surgeon Captain and Mrs Hersey leave the hospital to a fanfare from buglers of the Gibraltar Regiment

RETIREMENTS

SRA Barnard with SRA Milton-Thompson

Surgeon Rear Admiral E E P Barnard QHP is to retire with his successor as SRA (OMS) next June. Surgeon Rear Admiral Barnard joined the Royal Navy in 1956 after qualifying at St Mary's where he achieved some renown as a lacrosse player. After initial service with the Royal Naval Hospital Chatham he served at sea in *Bulwark* and then at the Air Medical School at *Dundee*.

Peter Barnard's subsequent professional service was in underwater medicine at sea in *Reclaim* and then at *Dolphin* in the Submarine Escape Tank. His professional results were continued subsequently at what was then the Royal Naval Physiological Laboratory to which he was seconded from the RN Medical School. He was promoted Surgeon Commander in 1966.

After a sabbatical secondment to St John's College Oxford he was awarded a DPhil for his thesis on the physiological effects of gases at pressure.

Work with the Joint Services Working Party on computing in medical practice followed and he joined the Medical Department then headed by James Watt with responsibilities for research. Peter Barnard was promoted Surgeon Captain in 1975 and was sent on exchange to the US Navy for a limited two years term to carry out research at the Naval Medical Research Institute, Washington. On returning in 1979 to take up the appointment of Head of Physiological Research in the Institute of Naval Medicine.

He left the Institute in 1980 to serve as Deputy Medical Director General (Naval) as a Surgeon Commodore and was promoted Surgeon Rear Admiral in February 1982 to become the first Surgeon Rear Admiral (Operational Medical Services) to further INM's research activities and practical support to the Fleet. In 28 years service Peter Barnard made a significant contribution to naval physiological research in the problems of pressure recognised by the Erroll Eldridge Prize and the Albert

[illegible] before the [illegible] Naval Medical Service. We wish [illegible] happy and contented [illegible].

Retirements

Surgeon Commander A W Snow-Brown
Surgeon Commander R du G Hanson
Surgeon Lieutenant Commander D S Forsyth
Surgeon Lieutenant Commander (D) M C Roberts

PLACED ON EMERGENCY LIST

Surgeon Lieutenant (D) N R Sturgeon

MEDICAL SERVICE OFFICERS

HONOURS

Serving Brother of the Most Venerable Order of St John of Jerusalem
Lieutenant F Reed

PROMOTIONS

To Commander and Head of MS Branch
H R Hussey

[illegible] H R Hussey

To Lieutenant Commander
W Nimmo-Smith

To Lieutenant (MS)
R D Jones M W Walker

RETIREMENTS

Commander M G Harper
Lieutenant Commander J Latimer

On Friday 20 April 1984 a rather special dinner was held in HMS *Dolphin* to mark the retirement of Professor **Kenneth William Donald OBE DSC MA MD DSc FRCP FRCPE FRSE** as Chairman of the Royal Naval Personnel Research Committee (RNPRC). The dinner was presided over by Surgeon Rear Admiral E. E. P. Barnard and was duly reported in *The Times* of the next day. The inevitable impersonal and dispassionate reporting of the event disguised a truly remarkable meeting in honour of an even more remarkable man. The dinner was attended by the Medical Director General (Naval) Surgeon Vice Admiral R. J. W. Lambert, and his three immediate predecessors. Also present were serving and retired Royal Navy medical officers, distinguished scientists from the fields of hyperbaric medicine and physiology, representatives of the Medical Research Council and Ministry of Defence (Procurement Executive) and last, but by no means least, serving and retired submarine and diving officers whose presence was adequate testimony to the esteem those branches of the Royal Navy have always accorded Ken Donald.

The achievements of Professor Donald as Chairman of the RNPRC from 1970–84 were duly acknowledged by Surgeon Rear Admiral Barnard, but a number of other revealing facts emerged to illustrate the truly distinguished career of the guest of honour.

Ken Donald entered the RNVR in March 1939 after establishing himself as an outstanding scholar and junior doctor at Emmanuel College Cambridge and St Bartholomew's Hospital London. In little over one year he was to be involved in the First Battle of Narvik where he earned a Distinguished Service Cross for his courage, tenacity and ingenuity in caring for the wounded survivors of HMS *Hotspur*. After transferring his patients to three other ships in hostile waters and then to the shore in Iceland, he remained with his patients until able to arrange their safety of the British Isles.

Following this remarkable episode he soon moved into the field of hyperbaric medicine and in 1942 commenced his classic studies into the dangerous effects of hyperbaric oxygen on the central nervous system. This work, rightly renowned and still widely quoted, set a standard for fundamental hyperbaric research which has rarely, if ever, been surpassed and earned him a status comparable to other giants of hyperbaric [illegible] as Haldane and Behnke.

Promotion to Surgeon [illegible] Commander RNVR duly followed but his 1944 application to be graded as a Specialist in Experimental Diving was rejected in terms and on grounds which may not be unfamiliar to present day Royal Naval medical officers.

In 1946 the end of World War II led to retirement (the first!) and a return to clinical medicine. He returned initially to St Bartholomew's Hospital and in the ensuing years his prowess led to his appointment in 1959 as Professor of Medicine, Edinburgh University, a post which he held until his second retirement in 1976. During this period he maintained a very close interest in the Royal Navy, particularly in the research being carried out on deep diving and submarine escape. Without doubt his influence in these areas was, and still is, of inestimable value. Chairmanship of the Underwater Physiology Sub-Committee of the RNPRC came in 1954 and was followed in 1970 by Chairmanship of the RNPRC itself. In these roles he has been a constant and generous source of advice and encouragement to those working in the fields of hyperbaric physiology and medicine, but has never wavered from an absolute requirement for scientific work that was honest, accurate and worthy. Many are the medical officers and civilian scientists who have gained immensely from his wisdom, even if work that was not up to the required standard met with firm, yet always benevolent, chastisement.

All the while his accomplishments in the wider field of medicine gained increasing recognition even though they are too numerous to mention here.

And so to his third, most recent retirement. Lest this resemble a requiem, there is every indication that this most recent retirement will prove to be equally as profitable as the first and it is clear that his influence will continue in the fields of Royal Navy and commercial diving and submarine medicine. Long may this be so and long may it be that tyros in the field of hyperbaric research are subject to the stringent remit to pass muster by Ken Donald.

Meanwhile it is sufficient to record that the Royal Navy is greatly indebted to the endeavours of this remarkable man.

Acknowledgement

The Editorial Committee is grateful to the Departments of Clinical Photography and Medical Graphics, RNH Haslar, for their assistance in the production of the *Journal*.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

HONOURS

Commander (Sister) of the Most Venerable Order of St John of Jerusalem
Miss M E Collins CBE RRC

PROMOTIONS

To Superintending Nursing Officer
Miss L M Melly

To Senior Nursing Officer
Mrs F A Wills

To Nursing Officer
Miss J Cotter

ROYAL NAVAL RESERVE

PROMOTIONS

To Surgeon Lieutenant Commander
D Beeford (Leeds CTC)
J M C Ward McQuaid (Notts CTC)
J R Washey (PRESIDENT)

To Surgeon Lieutenant Commander (D)
S H F Jacques (Notts CTC)
J C Judge (GRAHAM)
E D T Usher (WESSEX)

Inter-service rugby football

RNMS v RAMC/RADC

The ninth annual fixture between the two teams was contested on 4 April at Monkton Sports Ground, Alverstoke.

The game kicked off with the Army electing to play with the strong easterly wind at their backs. Within two minutes of the start a somewhat speculative kick ahead resulted in the Navy full back allowing the pursuing wing threequarter to score after his abortive attempt to fly hack the ball into touch had failed. The try was converted. The Navy reduced the deficit 17 minutes later when from a quick heel MT2(P) Pete Melford dropped a goal from 22 metres out.

The gusting wind was used to good effect by the Army stand off half who repeatedly reversed with interest any hard won ground gained by the labouring Navy forwards by sending huge garryowen kicks deep into the Navy half. As a result of the pressure induced by this tactic the Army won a penalty for offside and increased their lead after 20 minutes. From the ensuing drop out the Navy were awarded a penalty which they failed to convert. Three minutes later the Army capitalised on another Navy infringement and converted their second successful penalty. The Navy failed to reduce the arrears in the 32nd minute by missing a further penalty. The Army regrouped at half time 12 3 to the good after having withstood mounting Navy pressure towards the end of the half.

At the commencement of the second half it was quite obvious that the Navy forwards although outweighed were going to take the play to their opponents and after only five minutes earned a hard won penalty. The kick was missed. At this stage it was most important that the Navy should return a score as the Army were spoiling effectively and frustrating Navy attempts to release their talented back division. The break came in the 52nd minute when the hooker Sub-Lieutenant Steve Jackson bulldozed his way over the Army line from 10 metres out for a remarkable individual try. The conversion was duly missed. The Navy pack continued to drive into the resolute Army forwards who three times successfully thwarted try scoring opportunities on their line. However the Navy were rewarded for this period of relentless pressure when a ball recycled quickly to the backs close to the Army line allowed Surgeon Lieutenant Commander (D) John Hacker to run in unopposed in the 58th minute. He successfully kicked the conversion to give the RN Medical Services a 13 12 lead.

The remainder of the game was played almost entirely in the Army half punctuated only by the Army stand off relieving the pressure with well directed kicks to touch or almost kinks ahead. Towards the end the Navy forwards began to enjoy the better of what had been a bruising yet well contested forward battle while the backs seldom in the game as a team tackled with total conviction and covered well. The game ended with the Navy having missed a further three penalty attempts firmly encamped deep in the Army half but glad to hear the final whistle.

The No 8 and Captain Sub-Lieutenant Terry Magnaign received the Leopold Trophy and congratulations from Surgeon Vice Admiral R J W Lambert QHP MDG(N).

The closeness of the result and the committed manner in which the Army played the game has served notice that next year's fixture on their ground will be an even greater test of the RN Medical Services ability to retain the trophy.

RAP

DEFENCE COUNCIL INSTRUCTIONS

DCI RN 526/83 Amendment to DCI RN 416/83—Malaria change in medication

5/84 Amendment to DCI RN 416/83—Malaria change in medication

13/84 QARNNS ratings—incorporation of advancement regulations into BR 1066

21/84 List of Admiralty Surgeons and Agents

33/84 Courses—Ratings—Medical Branch—portable X ray machine familiarization

53/84 Promotion to Chief Petty Officer/Chief Medical Technician and Chief Communications Technicians—results of 1983 selection boards

89/84 Medical—dental treatment—entitlement and facilities

91/84 Medical Branch Ratings—Professional Qualifying Examination for CPOMA/MTI

115/84 Transfer Board for medical officers wishing to transfer to a Full Career Commission

NOTICE

The Journal [illegible] a year (in March, July and [illegible] comprising three [illegible]. The rates of subscription are:

1 RN and RNR medical and dental personnel on the active or retired list [illegible] the Royal Navy Medical Service officers and ratings and members of the QARNNS—£8·00 per annum post free (single copies £2·80)

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A Colour Atlas of Accidents and Emergencies

Kenneth Mills, MA, BSc, FRCS
Consultant Orthopaedic Surgeon Grampian Health Board

Richard Morton, MSc, FRPS, AIMBI
Director Department of Medical Illustrations University of Aberdeen

Graham Page, MBChB, ChM, FRCS
Consultant in Accident and Emergency Care, Grampian Health Board

Rapid recognition and handling of common surgical and non surgical problems in casualty departments and emergency units will be greatly aided by the many beautiful full colour detailed explanatory photographs. A very wide range of frequently encountered conditions are illustrated and procedures for coping with them are depicted in clear stages with direct specific suggestions for treatment and comments on hazards to be avoided. The strength of this book lies in its sheer practicality and its usefulness at different levels for rapid reference and confirmatory instruction.

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Contributions should be submitted to the Editor **Journal of the Royal Naval Medical Service Institute of Naval Medicine, Alverstoke, Hants PO12 2DL**, who will arrange for any necessary security clearance. The attention of Medical Branch personnel is drawn to the provisions of QRRN Appendix 35 J

Manuscripts should be prepared in the Vancouver style.[1,2] They should be typewritten with double spacing and wide margins and should include title page, abstract (of not more than 150 words), introduction, method, results, discussion and references, each section commencing on a separate page. A convenient length is between 2000 and 3500 words plus essential tables or illustrations

Tables and illustrations should be referred to in the text. Tables should be typed in double spacing on separate sheets. Figures should be professionally drawn making due allowance for the appropriate reduction. Glossy black and white photographs should be submitted unmounted whenever possible. Titles and detailed explanations should be given in the legends which should be typed on a separate sheet.

References should be numbered consecutively in the order in which they are first mentioned in the text. At the end of the article the full list of references should give the names and initials of all authors (unless more than six, when only the first three should be given followed by *et al*). The authors' names are followed by the title of the article, the title of the journal abbreviated according to the style of *Index Medicus*, year of publication, volume number and first and last page numbers. Titles of books should be followed by the place of publication, the publisher and the year, e.g.

Soter NA Wasserman SI Austen KF Cold urticaria: release into the circulation of histamine and eosinophil chemotactic factor of anaphylaxis during cold challenge *N Engl J Med* 1976 **294** 687 90
Osler AG *Complement: mechanisms and functions* Englewood Cliffs Prentice Hall 1976

1 The Vancouver style *J roy nav med Serv* 1979 **65** 179
2 International Committee of Medical Journal Editors Uniform requirements for manuscripts submitted to biomedical journals *Br Med J* 1982 **284** 1766 70

Single copies £3.50 (RN & RNR £2.80)
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A Med[illegible] S[illegible] R[illegible] Navy Sch[illegible] centenary [illegible] S[illegible] Rates Mess [illegible] Huslo [illegible] the s[illegible] MBE [illegible] Med[illegible] Depart[illegible] 350 [illegible] MBE who [illegible] year w[illegible] and [illegible] of [illegible]

Editorial

Since my last editorial there has been a period of considerable change and uncertainty within the Royal Naval Medical Service.

At the beginning of the year the Secretary of State for Defence announced that Sir Henry Yellowlees would undertake a review of the Defence Medical Services against the assumption that there will continue to be three uniformed Medical Services. The terms of reference for the study were divided into three parts. In part one Sir Henry was invited to consider the form of a headquarters structure which might bring together the policy and administration of the medical resources of the three Services more effectively and economically. Part two was to consider arrangements for use of MOD, NHS and private sector resources and services, in particular as regards hospitals in training use and position so as to achieve maximum cost effective use of all resources and when such use is basis for settlement of costs. Part three was to consider the role of reserves in mobilisation which could lead to resources on the outbreak of war. It is worthy of note that this is the 97th study of one sort or another into various aspects of the Defence Medical Services since 1972.

The study commenced in March and Part I of the report was published at the end of June. The recommendations for the medical staff section of a Surgeon General in overall charge who is to be appointed from the Army and under him two Deputy Surgeons General (Medical) one each from the Navy and Royal Air Force and also a Deputy Surgeon General (Dental). There will be six Assistant Surgeons General (medical) with the Deputy Surgeons General (Medical) responsible respectively for Organisation/Operations/Plans Service Hospitals Medical Supply Environmental Medicine and Research Personnel and Training and Nursing. Beneath the Deputy Surgeon General (Dental) will be two Assistant Surgeons General. The Surgeon General will be at three star level the Deputy Surgeons General at two star and the Assistant Surgeons General at one star.

The Surgeon General and his staff will be supported by a central Secretariat and Finance Department which will be headed by an Assistant Secretary a reorganisation which follows the example set by MOD(N)'s existing department.

These recommendations have been accepted by the Secretary of State except that Personnel Management will continue on a single Service basis with the appropriate Principal Personnel Officer. The recommendations are to be implemented by 2 January 1985. This leaves little time for planning and the organisation will have a radical change. The Surgeon General will be Head of the Royal Army Medical Corps and the Deputy Surgeons General will be by Heads of their respective Medical Services. It is not yet clear how the manning staff will interface with the peripheries of the RNMS not indeed how the reorganisation relationships will be affected and considerable relocation will be required to allow the reorganisation to be effective.

Part II of the study is being actively pursued and that part of the report will be published at the end of October. A very strong plea has been made to Sir Henry that no further reductions in the existing resources are made as the RNMS cannot tolerate disturbance of the fine balance that exists between provision of service training, recruitment and retention as we are to continue to provide support to the Royal Navy and Royal Marines. The strength of the RNMS in future will depend more than most on our strength within periphery and we cannot all work to this end.

As most of you will know the problems which beset us have been compounded by the ill health of Surgeon Vice Admiral K. J. W. Lambert Medical Director General (Naval). We can all very sad that MDG(N) was forced to go off sick at the end of May and despite his keen desire to return to work his health unfortunately has decided that he will not be able to do so. He is very much in our thoughts at this time and we send him our best wishes.

In past editorials I have indicated the policy of the Editorial Committee now that the scope of the Journal and to attract a greater breadth of contributions. This edition has certainly achieved this with articles from serving officers scientific officers retired nursing officers and not least a retired Surgeon Rear Admiral. I am particularly pleased to publish this last of two articles on aeronautical medical matters which underlines the outstanding quality of the medical students who are recruited into the RNMS. It is also encouraging that we now have more material than we can publish in this edition—a healthy situation indeed. Long may it continue.

Sadly Surgeon Vice Admiral Lambert's health deteriorated while this Journal was in press and it is with the deepest regret that we have to report his death on 1st November at the age of 56. We extend our sincere and heartfelt sympathy to his wife Lois and his children Caroline and Charles.

[illegible] Serv 1984 70 134–139

Non freezing cold injury: A historical review

T J R Francis

INTRODUCTION

NON FREEZING cold injury (NFCI) is the term used to label the syndrome that results from damage to tissues that have been cooled usually for prolonged periods, at temperatures between about 15° and their freezing point (−0·55°C). This condition has remained somewhat obscure because its occurrence in civilian life is not common although cases are occasionally reported in the elderly,[1] alcoholics[2] and those on outward bound activities.[3] In the military context, on the other hand, NFCI has all too often claimed numerous non battle casualties during warfare conducted under inclement weather conditions. In modern times each such conflict has provided fresh research into this condition yet a satisfactory solution remains elusive.

This article traces the history of NFCI and in a second paper the pathophysiology of the condition such as it is understood will be discussed.

THE HISTORY OF NFCI

Cold injuries amongst servicemen are no novelty. Schechter and Saroff[4] trace descriptions of such injuries as far back as Xenophon's experiences in Persia about 400 BC. Although no clinical details are recorded it is clear from the account that both local (in this case probably freezing) cold injury and general hypothermia were responsible for numerous casualties. More recently a similar fate befell large numbers of Americans during the War of Independence. In 1778 for example, nearly ten percent of an army of 10 000 men had, according to George Washington,[5] been left to perish by 'winter cold and nakedness'. The journal of the medical diarist Dr James Thatcher[6] for the years 1776–1783 makes reference to other similar instances where again freezing injury and hypothermia were the likely diagnoses although the differentiation of cold injury into freezing and non freezing varieties had yet to be made. Indeed, that cold as such was the causal factor in this type of 'mortification' was still far from clear.

It was Baron Larrey, surgeon to Napoleon's army, who recorded the first careful observations on cold injury.[7] From translated extracts of his writings[8] it is clear that he considered ill controlled rewarming of cooled or frozen extremities principally to blame for the manifestations of cold injury. He observed that even when troops were exposed to very severe weather they remained uncomplaining until the temperature increased or they warmed themselves by fires. Only then did they experience 'congelation'. He wrote: 'Cold acts on the living parts by blunting the sensibility of those organs which are subjected to its immediate impression: the natural heat is absorbed, and a discharge and repercussion of caloriek takes place; the pores are closed, the fibres and capillary vessels fall into a state of contraction, the fluids are condensed and flow more slowly. The parts may remain for a longer or shorter period in this state of asphyxia without losing their life; and if the cold be removed by degrees or if the person affected by it pass gradually into a more elevated temperature, the equilibrium may be easily re-established with the function of the organs, and the disposition that the parts have to fall into gangrene is removed; but if on the contrary, persons who are thus affected by cold pass suddenly from a temperature at the freezing point to one more elevated, an obstruction of the parts affected must of necessity be produced, and if it be considerable, the vessels loose their elasticity altogether, become paralysed and sometimes burst or are torn asunder; and hence follow blisters, red cracks or fissures of the part.'

THE CRIMEAN WAR (1845–1855)

The next step forward in the understanding of cold injury was made during the Crimean War. Here the

ctreemstances were qnite different to those experieeced by Larrey Firstly rather than the relatively free flowing formation battles of the Napoleonie wars this conflict was conducted ie the form of dogged treech warfare. Secondly the Brtish troops involved were particularly during the winter ill equipped underfed poorly accommodeted inexperieneed and debilitated by diarrhoea and dysentery ' The weather on the other hand was nothing like as severe as that experieeced by Napoleon s troops in Poland and Reesia. Indeed during the first winter the temperatere only occensionally fell below freezieg. Despite this 1924 cases of' frostbite were reportd ie e force of just under 50 000 men (And this is almost certainly a considerble eerder estimate, as mild cases failed to report sick and those dying from other eaeses were not recorded ie the eold injury statistics) Dr Loegmore a medical officer serving with the army stated at the time' that the "frostbite which occurred dering the winter 1'54–55 could not be attributed to the severity of the climate, but was chiefly owieg to the exceedingly depressed vital power which characterised the general coeditioe of the soldier at that period" Criticism was also levelled at the boots worn by the men they were considered to ba defective and quite unsuitable for the required type of operation" In partienlar it was noted that they had often been fitted ie too small a size and the men were afraid to remove them in case they were unable to don them egain.

The incidenee of frostbite in the second winter of the eampaign was much lower despite similar weather conditions Only 474 cases were reported ' It would appear reasonable to eitribete this improvement to the fact that the men were now seasoned troops who had gained some endersianding of how to protect themselves from the cold and were better fed ned accommodated Importantly the command although waging a similar style of warfare rotated the troops more frequently thns requiriey eech mne to speed shorter periods ie forward treeches

WORLD WAR I (1914–1918)

It is sad to relate that many of the lessons learned by the British Army in the Crimea appear to ha e beee forgotten by the eetbreak of the First World Wer some sixty years later With the eeset of wieter re 1914 there was ae explosion of eold iejery cases amongst the troops of the British Expeditionary Force From a siegle case being recorded ie September the ieedeeee rose to 1555 in November and 4823 ie Deeember ' Few if any medieal officers were familiar with the management of eold injury and confnsion existed eie [illegible] the condition. ''

Initially all cases were labelled frostbite as had classically been the precedent despite it being recognised that freezing of the tissues rarely if ever occurred in eases being recei ed from the trenches Indeed the condition appeared to run a differeet ellerical course to classieal frostbite ' Alternative names were proposed including froidnre "frigorism" cold bite" and water bite How ever by 1916 the term Treneh Foot was in general usage and the distinetion betw ei e freezieg eed eoe freezing eold injery had beee made

Considering the scale of the epidemie of NFCI e the early years of the war there are serprisiegly few referenees in the literatere relet teg to first hand observation of the coeditioe There is however a most interesteg accoeet by a Regimental Medeal Officer serving ie the trenches in tate 1915 Hughes' deserihes three stages in the development of Treeeh Foot. Stage I the early phase of the coedtioe presented as oedema and tenderness of the sole of the foot and its onset was freqeently within 48 hoers of adequate exposere In those who delayed reporting eek for only 24 hoers this progressed to Stage II This was characterised by parnesthesiae numbness considerable oedeml and slnggish peripher' ireeelation pain however was not esnally a marked fi atere on presentation Stage III which he did not observe amongst his own mee bet had witnessed in hospital was said to ecenr when Stage II progressed to gangrene Longie ' described similar states but included in Stage II the presence of serosanguinous hullae on the skin of the foot

Heghes initially thought that an infeeus agent in the foetid trench mud was responsible for this condition bnt after careful observation of the environment in which the injury developed. concluded that two agents were at work—a predisposing factor of fatigee and an exciting factor of venous stagnation Interestingly eeough he failed to gi e dne prominence to the role of eold in the aetiology of Trench Foot He was not alone ie this view Sir William Osler in a letter to the Lencet' stated his opinoe that eold and wet were relatively eimportant aetiological factors compared with the veeous stagnation associated with meseh. mertia caused by the relatively static lifestyles of soldiers in treeches

It was as a result of both eherical examination and experimeetal proeedures on the hind feet of rabbits that Smith Ritchie and Dawson ' were left in little doubt that eold wet conditions and clothing or footwear that were sefficiently coestricting as to redeee foot blood flow were the eaeseative agents

They also observed that soldiers frequently were in the habit of covering their feet in oil and concluded that either the effect of massage or the insulating quality of oil may be of benefit in preventing cold injury. They proposed a series of preventative measures, which the army, clearly anxious to improve what was a most serious situation, accepted. On 28 November 1915 the Adjutant General's routine order GRO 1275 was issued[3] and paragraph 4 is worth quoting in full. It read:

In order to minimise the prevalence of chilled feet and frostbite Commanding Officers will be held responsible that the following instructions are carried out unremittingly and under the strictest supervision.—

a. Before entering the trenches feet and legs will be washed and dried, then well rubbed with whale oil or anti-frostbite grease and dry socks put on. It is of the utmost importance that whale oil or anti-frostbite grease should not be merely applied but thoroughly rubbed in until the skin is dry. Unless this precaution is systematically carried out the oil and grease become in great measure valueless.

b. A second pair of dry socks will be carried by each man and where possible battalion arrangements will be made for socks to be dried and reissued during each term of duty in the trenches.

c. While in the trenches boots and socks will be taken off from time to time if circumstances permit, the feet dried, well rubbed and dry socks put on.

d. On no account will hot water be used nor the feet held near a fire.

e. Where possible hot food will be provided during tours of duty in the trenches.

f. Where circumstances permit long gum boots will be put on while the men's feet are dry before entering the trenches in order that they may start their tour of duty with dry feet.

g. Where gum boots are worn it is well to support the socks by some sort of fastening such as a safety pin, to prevent them working down the heel. On no account will anything in the form of a garter be worn.

h. Where conditions are favourable regimental rest posts will be instituted in proximity to the trenches where men who show signs of suffering from exposure can be promptly attended to.

In addition to the above measures tours of duty in the trenches were reduced from a period of days to no more than 24–36 hours.

These measures proved to be effective and the incidence of trench foot per 1000, which had been unacceptably high at 33.97 and 38.43 during 1914 and 1915 respectively, fell to 12.82 in 1916, 11.34 in 1917 and 3.82 in 1918.[6]

By 1917 the habit of using whale oil or anti-frostbite grease (composed of whale oil, tallow and boric acid) had fallen into disfavour principally because of its offensive smell and the uncleanliness implicit in its use. As it had been in practice rarely possible for feet to be washed in the field, a certain amount of trench mud was unavoidably rubbed into the feet along with the oil. Futhermore socks impregnated with mud and oil were very difficult to wash; consequently the French practice of applying a foot powder made of borated talc and camphor was adopted,[6,7] which was most effective when gum boots were worn and the men were provided with a daily change of socks. Hence provision was made for forward divisional gum boot stores to be established where boots were cleaned and dried.[1] Finally foot washing centres, as described by the French were set up in forward positions,[3] each of which could handle the throughput of a whole battalion per day. It is likely that these measures and the widespread awareness of the problem they created resulted in the remarkably low incidence of Trench Foot in 1918. Needless to say this was achieved at the cost of considerable logistic commitment that, whilst possible in relatively static trench warfare, would be difficult to provide in more modern mobile styles of conflict.

As has been outlined, the major drive to find a solution to Trench Foot was a preventive one. This is not because there was any lack of effort in attempting to provide a cure. Indeed many therapeutic regimens were proposed ranging from the conservative measure of bed rest, elevation of the foot, skin care (aimed at preventing secondary infection) and light bandaging, to the more esoteric. These included the electrical treatment of muscles,[1] the use of nitroglycerine and strychnine, and the somewhat bizarre subcutaneous injection of oxygen.[6,7] The requirement for analgesia was often considerable as severe pain, particularly at night, was a diagnostic feature of recovery.[6] This was generally achieved with salicylates although morphine was occasionally required. The rapid rewarming of tissues was not generally practiced, most probably due to the findings of Smith, Ritchie and Dawson that oedema in cold injured rabbit's feet was greater when they were rewarmed in water at 37 C than when they were allowed to rewarm spontaneously. Furthermore it was widely recognised that the degree of discomfort experienced by the patient was often proportionate to the temperature of the foot.

It therefore became general practice to allow feet

to lewarm spontaneously and when warm to cover them only with a thin layer of gauze and a sheet. In cases of dry gangrene (Stage III) the prophylaxis administration of tetanus antitoxin was recommended and surgery resorted to as a final measure and aimed at minimising tissue loss [3, 4]. In cases of moist gangrene more prompt surgical intervention was often required and Lisfranc's, Chopart's, Symes' and Pirogoff's operations were recommended [3].

This shows as a brief distillate of widespread disagreement as how to best treat Trench Foot. As it remains today. It was sadly the case that no satisfactory regimen was found. Of concern was the observation that even those presenting with Stage I Trench Foot who returned to the trenches apparently recovered after ten days hospital treatment, frequently relapsed.

World War I demonstrated that Trench Foot represents a potent threat to the operational capability of the foot soldier in cold, wet conditions. It was effectively conquered by preventative measures. These involved:

a. Minimising the individual soldier's exposure to circumstances likely to provoke the condition by frequent rotation of those at risk, and

b. The strict supervision of a comprehensive foot care programme.

WORLD WAR II (1939–1945)

Probably due to the brevity of the interval between the wars, the lessons of the First World War were not lost on the British Army. The same cannot be said for the Americans and a comparison between the performance of the two armies is of interest.

During the cold winter of 1944–45 the British suffered only 206 cases of NFCI in the European theatre of operations. This contrasts starkly with the American experience of some 71,000 over the same period[5]. There were however some differences in the conditions experienced by the two armies. The same cannot be said for the Italian Campaign in the winter of 1943–44. Here the British 10th Corps formed an integral part of the 5th US Army. During the period 4 December 1943–19 February 1944 a total of 102 cold injuries were reported amongst the British, representing a ratio of 1:45 with battle casualties. US troops on the other hand suffered no fewer than 4,560 cold injuries over the same period, a ratio of 1:4 with battle casualties. Even under identical conditions such as the Anzio beachhead the US troops suffered approximately ten times the incidence of cold injuries incurred by the British.

Whayne and Du Bakey[6] in a lengthy refutence to this subject started by saying: 'It is a lamentable but nonetheless incontrovertible fact that most of the serious losses which occurred from cold injury among the United States Army troops in World War II should not have occurred. It would be less than candid not to acknowledge this painful truth.' They analyse in detail the reasons for the different performance of the two armies and their conclusions may be summarised as:

1. A greater British discipline in enforcing foot care routines. Essentially these were the same as those in use at the end of the First World War (but without the luxury of foot washing centres and divisional gum boot stores). The relatively low incidence of NFCI in US troops during World War I meant that no such protocol had been adopted. On entering World War II even when the necessity for such a protocol had been demonstrated and eventually established it was not well enforced. Indeed it was a matter of debate as to whether those who contracted NFCI should be disciplined or awarded the Purple Heart!
2. The British practice of keeping troops in forward positions for much shorter periods than the Americans. (It was British and Canadian policy to keep men in the front line for no more than 48 hours).[7]
3. The relative superiority of the British Army boot, in that it was:
   a. Available in a greater number of sizes.
   b. Looser fitting and hence could be worn with two pairs of socks.
   c. It was slightly more waterproof.
4. The British habit of taking a hot drink (usually tea) whenever possible – a custom not prevalent amongst American's.

The Second World War resulted in the description of another variety of non-freezing cold injury, namely Immersion Foot. The first reports of this condition appeared in 1942. Webster *et al*[8] observed 142 cases of shipwreck survivors who had existed in lifeboats or on rafts for periods ranging from 32 hours to 22 days. On rescue these patients had feet that were cold, swollen and waxy white in colour with scattered cyanotic areas. They complained that their feet which had invariably been immersed in sea water whilst awaiting rescue felt heavy, woody and numb—being anaesthetic to pain, touch or temperature. Shortly after removal from the cold wet environment the swelling rapidly increased and the feet became red, hyperaemic and hot without sweating. The pulses were full and bounding. The more severely damaged areas, usually the toes, the distal part of the dorsum and the ball of the foot, remained oedematous and hot and assumed a livid cadaveric appearance. A

number of these areas produced blebs some of which were filled with straw coloured fluid and others with extravasated blood. Areas of ecchymosis commonly appeared over the other parts of the foot. Although the authors cite only few recorded water temperatures of between 1°C (34°F) and 2°C (36°F) this would not appear to matter greatly as survivors from the Gulf Stream who recovered in Norfolk, Virginia, has a similar condition resulting from immersion in water at between 15°C (60°F) and 21°C (70°F).

Recovery from this form of NFCI was usually heralded by the onset of intense paraesthesiae on about the eighth to tenth day after rescue. This took the form usually of an intense burning sensation over the surface of the whole foot lasting about 24 hours being replaced by intermittent, stabbing, shooting pain with more or less continuous tingling sensations. This lasted for up to three or four weeks. Ungley and Blackwood described another series of more than 80 cases in which hands which had been similarly exposed were also noted to suffer immersion injury. In both papers the similarity of this condition to Trench Foot was remarked upon.

Ungley and his co-workers continued their observations and in 1945 produced an excellent account of the Immersion Foot Syndrome. It is described as occurring in four phases. The first three, namely the exposure, prehyperaemic and hyperaemic phases are described above. A fourth post hyperaemic phase is described which is characterised by cold sensitivity and hyperhidrosis that may persist for years. Other long term complications including persistent pain and contractures have been described.[2,3] It is of interest that the cold sensitivity described affected only about half of Ungley's cases and did not necessarily relate to the severity of the initial cold injury. The hyperhidrosis also has an interesting feature in that it is provided by emotional rather than thermoregulatory stimulation.

The Pacific Campaign produced another variety of immersion injury, which in many ways resembled Trench Foot. Initially described as Tropical Immersion Foot,[4] the syndrome consisted largely of the familiar pattern of Stages I and II Trench Foot as described by Hughes.[5] Its onset was provoked by 4–7 days exposure to jungle warfare in warm but very wet conditions. Although Whayne and de Bakey do not quote any water temperatures they consider it was sufficiently low to promote significant, prolonged tissue cooling and consequently Tropical Immersion Foot may be considered to be another variant of NFCI. Thus it may be that the arbitrary figure of 15°C being an oft quoted skin temperature upper limit likely to result in NFCI, needs to be revised upwards.

It is likely that the relatively limited degree of tissue oedema compared with classical Trench Foot accounts for the slight variation seen in the acute phase of the syndrome. Oedema, pain and paraesthesiae appear to be more pronounced and manifest earlier. Ulceration, particularly of the dorsum of the foot and around the toes was common and numbness and anaesthesia were not marked features. Perhaps the greatest difference between Tropical Immersion Foot and Trench Foot is apparent during the recovery phase. Of 120 soldiers surveyed at two evacuation hospitals during the Leyte Campaign in the Philippines most had recovered from the pain, swelling, exhortations and vasomotor manifestations after ten days.[4] The reasons for these differences remain unclear.

KOREAN WAR (1950–1951)

Although there were large numbers of cold injury casualties during this conflict by far the majority of both Commonwealth[6] and American[10] cases were of frostbite with insignificant numbers of NFCI casualties reported.

VIETNAM WAR (1960–1976)

During this conflict infantry were subjected to prolonged periods during which their feet were either immersed in water or prevented from drying, due to the coating of mud on their boots. A condition called 'Paddy Foot' was described[1,2] which bears a striking resemblance to the Tropical Immersion Foot seen at Leyte in World War II. Whether or not it represents a separate clinical entity is debatable, what it does demonstrate is that prolonged immersion in water as warm as 29°C[11] can result in an injury similar in many ways to NFCI.

FALKLANDS WAR (1982)

Much of the data gathered during and after this war remains classified or yet to be published. The weather conditions and the style of warfare were tailor made for NFCI. Mean air temperatures of 10°C by day falling to −4°C at night (personal communication) particularly on high ground were cold but not sufficiently so as to result in frostbite. Many men had a wet landing before digging in to the waterlogged, peaty soil of East Falkland. The limited availability of manpower meant that adequate troop rotation was not possible. The footwear was heavily criticised and the supply of hot food and drink was limited. Although foot care routines were generally well adhered to particularly by the Royal Marines many of whom were arctic

trained and realised its importance the result was that 20% of all British casualties evacuated to the Hospital Ships were due to NFCI and many of those who failed to report sick at the time later admitted to symptoms compatible with a diagnosis of Stage 1 Trench Foot

CONCLUSIONS

NFCI represents a potent threat to infantry and marine operations carried out in inclement weather conditions. If contracted not only will it reduce the man's mobility at the time but it may through cold sensitisation compromise his ability to fight in similar conditions in the future

The aetiology of the condition is multifactorial Prolonged exposure to cold and/or wet conditions are a prerequisite with venous stagnation (due to posture or constricting footwear) dehydration, inadequate food the stress of front line operations, intercurrent illness or injury and fatigue promoting its onset The pathophysiology has yet to be clarified and to date no satisfactory treatment has been found As a consequence the principle measures taken to combat this condition have been preventive and they have met with considerable success particularly as applied by the British in World War I Such comprehensive measures are difficult to apply to modern warfare particularly as practised by the marines current foot care routines alone have proved to be an inadequate defence against NFCI

If there is a future requirement for infantry to operate in cold wet conditions without relief for more than a few days, fresh solutions compatible with modern warfare need to be found if such operations are not be jeopardised by NFCI

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Is frostnip important?

D I Riddell

INTRODUCTION

ANECDOTAL evidence among Royal Marines serving in the Arctic indicated that they had accepted frostnip as an occupational hazard which could be ignored. No attempt had been made to define the condition. During four winters in the Arctic, the author gained the impression that it was the same men who suffered this affliction year after year. He defined frostnip as 'cembeeks ned whiteness of the skin which disappears within half an hour of rewarming the affected part with body heat'.

Rewarming of hands is done by the sufferer himself by placing the hand in his axilla or groin. Rewarming of feet requires the co-operation of a 'buddy' who allows the use of his hands or abdomen to supply warmth. The stopping of any formation of skiboree personnel for greater than 30 minutes to rewarm one casualty jeopardises the other troops unless shelter is available for all. Alternatively, arranging a casualty evacuation consumes time and manpower.

It is said reflection of our practical knowledge of local cold injuries that Ward is the only author in the open literature to have made any comment on this seemingly innocuous condition. It occurs at a wind chill index of below 1400 (ambient temperature −10 to −15 C). Frostbite damages the tissues whereas frostnip produces reversible changes. In frostnip the skin blanches and becomes numb with a sudden and complete cessation of cold and discomfort in the affected part. A tingling sensation may occur on rewarming.

Washburn without mentioning the term 'frostnip' states that 'mere numbness of toes, fingers or feet followed by tingling after they have rewarmed does not constitute bona fide frostbite. True frostbite, even in its mildest form, results in some real damage to the affected tissue'. It seems reasonable to assume that 'real damage' implies loss of tissue.

Thilenius and Lewis noted the dilatation of blood vessels following thawing after even the lightest freezing. This manifested itself as redness of the affected skin.

Cooling of tissues and its eventual outcome is a dynamic process. Interference by the introduction of warmth or removal of cold can occur at any stage. It is extremely difficult to decide clinically at what stage a freezing injury actually occurs. Is frostnip part of the dynamic process that may lead to frostbite and thus a form of cold injury in its own right, or is it as is generally accepted an innocuous condition which can be ignored? The aim of this paper is to make the case for the former.

METHOD

On 31 January and 1 February 1980, the coldest period of weather recorded in Northern Norway for over 100 years occurred. Temperatures dropped to −35 C and winds gusted to over 40 knots (46 miles per hour). During these conditions 416 RM personnel were completing a foot day exercise in remote areas. They were tired, hungry and dehydrated, many were inexperienced and probably frightened. All subsequently completed a questionnaire. Data relating to the incidence of cold injury and past history of frostnip or any form of cold injury is provided below.

RESULTS

Of the 416 exposed personnel, 96 (23%) suffered frostbite. Among those who suffered frostbite 40 (42%) gave a past history of frostnip of hands or feet, either alone or in combination. Among the remaining 320 (77%) who escaped cold injury during the period in question, 49 (15%) gave a past history of frostnip of the hands or feet (*Table I*). Thus there is a significant relationship ($P<0.001$) between the occurrence of frostbite and a past history of frostnip.

The relationship between the morbidity of

Table I T[illegible] orbidity of frostbite in those with a past history (PH) of frostnip

	Frostbite 1980	*No Frostbite 1980*	*Total*
No PH of Frostnip	56	271	327
PH of frostnip	40	49	89
Total	96	320	416

frostbite and a past history of frostnip of the face alone was less significant ($P<0.05$) although there was a highly significant relationship ($P<0.001$) between a past history of frostnip of the face and its recurrence in 1980. There was also a significant relationship—although less so ($P<0.01$)—between a past history of frostnip of the face and the occurrence of frostnip of either feet or hands in 1980.

The relationship between a past history of frostnip of the hands and its recurrence in parts of the body other than the hands is less significant (face $P<0.01$ feet $P<0.05$) whilst those with a past history of frostnip of the feet prior to 1980 showed a significant tendency to have a recurrence in either feet, face or hands ($P<0.001$).

In the parent group of 416 there were 133 men experiencing their first Arctic winter who had a past history of frostnip but not of a more serious recognised form of cold injury. Of these 49 (37%) suffered frostbite in 1980. A number 23 of the 133 suffered a recurrence of frostnip in 1980 prior to the period of severe weather described above of these 18 (72%) subsequently developed frostbite.

Finally as part of a subsequent study the author followed up 43 men who had suffered superficial frostbite during 1980 to determine their morbidity to subsequent frostnip in 1981. It was found that 24 (56%) suffered frostnip during the 1981 deployment. This result is similar to the morbidity of frostnip in a control group of 61 who suffered frostnip in 1980 of whom 31 (52%) suffered a recurrence in 1981.

DISCUSSION

Schumacker and Lempke introduce their review of frostbite as follows: Frostbite has always occurred sporadically among the civilian population but it ordinarily occurs in great numbers only in time of war. This is understandable as it is essentially a disorder of privation and hardship. Though great numbers of cases have occurred in military campaigns the exigencies of war the unevenness of speedy evacuation of the injured from one medical installation to another the scarcity of personnel trained and interested in clinical investigation and the virtual impossibility of any individual or group following through any such casualties from the time of injury to final rehabilitation have rather effectively rendered this ample clinical material of little value in furthering the advance of our knowledge.

Fortunately prior to the 1980 Norwegian deployment the author had already taken a keen interest in the relatively hitherto neglected condition of superficial frostbite and so had initiated a protocol for studying the epidemiology of cold injuries in the troops being sent to Norway. A golden opportunity had been presented to make first hand observations on a large number of casualties without the encumbrance of having to deal with other battle casualties which most previous authors had to contend with. Additionally it was possible to study in detail a condition which in wartime may be considered trivial and not worthy of attention.

Conclusions based on information obtained through questionnaires are always open to criticism yet nevertheless much of the data obtained in this questionnaire study of 416 Royal Marines who were undertaking Arctic Warfare Training in 1980 confirms findings reported by previous authors in similar studies where such comparisons can be made.[3] It is reasonable to assume therefore that in general the individuals were honest in answering the questions in the questionnaire.

From the results obtained it is evident that a past history of frostnip predisposes one to subsequent frostbite particularly if the incidence of frostnip is followed shortly after by a severe cold exposure. This suggests that frostnip as presently defined is not a harmless phenomenon that is naturally reversible instead it would appear to be a predisposition that leaves a residual susceptibility to cold not just locally but throughout the peripheral circulation in other parts of the body.

The finding that the incidence of frostnip in 1981

was similar in a group who previously suffered frostnip and also a group with a past history of significant frostbite is further evidence that frostnip, like other forms of cold injury sensitizes the individual to subsequent injury and thus is a form of cold injury in its own right.

It is only possible to conclude regretfully that the innocuous condition of frostnip has the same widespread sequelae as superficial frostbite and thus should be treated with respect and when possible safeguarded against.

Acknowledgement

I would like to acknowledge the painstaking effort by those Royal Marines who completed the questionnaire which made this study possible.

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A comparison of lung volumes between divers and submariners in the Royal Navy

G M Clifford, D J Smith and Caroline S M Searing

Summary

A comparison of spirometric values in divers and submariners of the Royal Navy and their physical characteristics was undertaken. Four hundred and twenty two subjects were included in the study of whom 192 were divers and 230 submariners. Measurements of forced vital capacity (FVC) forced expiratory volume in one second (FEV) and FEV/FVC ratio were made using a single breath wedge spirometer (Vitalograph®). The data was analysed by multiple linear regression and analysis of variance. FVC and FEV, increased with height and decreased with age though inclusion of a quadratic age term showed that the decline with age did not begin until the mid thirties, easing doubt on the validity of predictive equations which assume a linear decrease from age 25. The divers had significantly larger lung volumes than the submariners though in this former this did not correlate with either experience or job classification. The FEV/FVC ratio diminished with age in both groups. It was also shown that those individuals with a large FVC tend to have a relatively lower FEV/FVC ratio than those with small FVCs. Pandiman equations for both divers and submariners were calculated which are more appropriate for determining expected values for the two groups than those currently in use.

INTRODUCTION

Increasing concern has been expressed as to whether the present regulations for the spirometric standards required by Royal Naval divers are appropriate. Referrals of divers with large forced vital capacities (FVCs) who fail to meet the required standards and where subsequent investigations do not reveal any abnormalities have formed the basis for this concern.

A study reported in 1977 by Crosbie *et al*[1] on 404 commercial divers heightened interest in this area. This study demonstrated that the divers had a mean FVC 120.4% of the predicted value. The mean expiratory volume in one second (FEV) was also increased but to a lesser extent.

In the follow up study on the functional characteristics of the large lungs found in the commercial divers Crosbie *et al* found that the FEV/FVC ratio decreased as the FVC increased above 100% of the predicted value. It was then belied that divers develop large lungs due to hyperinflation of the alveoli. As the airways do not dilate in proportion the relationship between FVC and the FEV/FVC ratio therefore changes.

Prospective entrants into the Royal Navy must meet uniform medical standards at the time of enrolment, irrespective of any future selection for specialised trades classification. Subgroups such as divers must then meet more rigid medical criteria because of the physical demands that will be placed upon them and the potentially hazardous environment in which they will work. Similarly submariners are further evaluated because of the requirement for them to undergo submarine escape training. Thus it might be expected that both groups should be matched at initial entrance into the Service, but not necessarily once they are separated into their specialisations.

This paper presents a comparison of the physical characteristics and forced spirometric values obtained from divers and submariners in the Royal Navy. The purpose of the study was to define the standards for these selected and healthy populations and determine whether there are reasonable indications that a change in the existing regulations for medical fitness for diving is warranted.

METHODS

All the subjects in this study were healthy male caucasians. Divers were drawn from three sources, 98 undergoing annual diving medicals at various naval establishments in 1982, 27 naval divers undergoing commercial diving medicals at the

Table I Regression [illegible]

		Regression coefficients			[illegible]	
Index	*Units*	*Stature*	*Age*	*Age*	*Divers*	*Submariners*
FVC	L	0·071	0·13	0·0023	- 8·85	8·60
FEV	L	0·054	0·07	0·0016	5·74	5·62
FEV FVC	%		0·025		+89·96	+88·48
						n 352

A[illegible]

Institute of Naval Medicine during 1981 1982 and 67 divers tested at HMS [illegible] by the authors during March 1983

Submariners were drawn from two sources 137 undergoing spirometric testing prior to training at the submarine escape training tank during the first quarter of 1983 and 93 submariners from the staff and personnel on course in the Submarine School HMS *Dolphin* who were tested by the authors in March 1983

Age was calculated as age in years on the date of test Heights were recorded in centimetres to the first decimal place with the subject wearing service shoes Weights without jackets, but wearing service shoes were recorded in kilograms to the first decimal place Diving experience was obtained by enquiry in years to the first decimal place with the date of initial diving medical and spirometry testing forming the basis of the calculation.

Divers were classified as either ships divers (trained only in the use of compressed air and restricted to a depth of 30 metres) or clearance divers (trained in the use of mixed gas and not restricted to a depth of 30 m)

Smokers were defined as those who had smoked any tobacco product in the three months prior to the date of the test

All measurements of simple forced spirometry were made using a dry wedge spirometer (Vitalograph[7]) The test was explained to the subjects in simple terms and three tracings were made with the subject standing and without a noseclip All the records were interpreted by the authors as recommended by the American Thoracic Society with the largest FVC and FEV being taken regardless of which tracing they came from All measurements were at BTPS

DATA ANALYSIS

The data was analysed using a Hewlett Packard 9800 Series Computer and programmes for multiple linear regression and analysis of variance

RESULTS

Four hundred and twenty two subjects were included in this study 192 divers and 230 submariners Analysis of the whole group showed height to be the most significant factor in the determination of FVC and FEV_1 but not the FEV /FVC ratio ($P<0·001$ mean height 178·6 cm range 162 to 198 cms) Age was also found to be highly significant for FEV FVC and FEV /FVC ratio ($P<0·001$ mean age 28·2 range 17–56 yrs) Due to the wide variation in the ages of the subjects, particularly the large number below the age of 25 a quadratic age term (age × age) was added to the analysis and was found to be significant for FVC and FEV ($P<0·001$) but not for the FEV /FVC ratio)

Separate analyses of divers and submariners again showed quadratic age and height to be the most significant factor for FVC and FEV Age was again the only significant factor in predicting the FEV /FVC ratio. Weight was not a significant predictor of any of the functions.

The regression relationships are given in *Table I* and illustrated in *Figs* 1 and 2

Analysis of variance revealed a significant difference between the divers and submariners for FEV, FVC and FEV /FVC ratio with the divers having significantly larger FVCs (mean FVC for divers = 5·71L and 5·50L for submariners) ($P<0·001$) and FEV s (mean FEV_1 = 4·65 for divers, and 4·56 for submariners) ($P<0·05$) The divers were also found to have significantly lower FEV /FVC ratios (mean ratio = 81·51% for divers and 82·93% for submariners) ($P<0·001$) Height and age were not significantly different in the two groups neither was the rate of decline in lung volumes of FEV /FVC ratio with age (*Fig* 3)

Inclusion of smoking habit in analysis of the whole group was not significant for any of the three variables Separation into divers and submariners demonstrated a significant effect ($P<0·05$) of smoking on the FEV /FVC ratio in the submariner

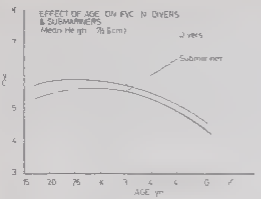

Fig 1

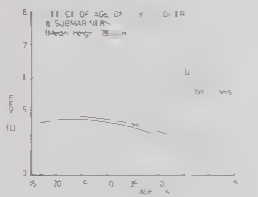

Fig 2

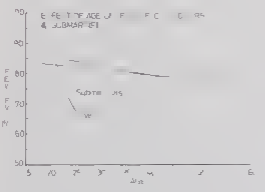

Fig 3

group with the ratio falling faster with age in the smokers (−0 362%/yr) compared with the non smokers (−0 236%/yr) No difference was found between the smoking and non smoking divers

Of the 192 divers 148 were ships divers and 44 clearance divers Mean values for both groups for FVC FEV$_1$ and FEV$_1$/FVC ratio are given in *Table II* Analysis of variance failed to show any difference between the two job classifications

Dividing the divers into inexperienced (those with less than five years diving) and experienced (those with five or more years diving) did not demonstrate any difference between the groups (*Table III*)

To make comparison of our FVC and FEV$_1$ results with published prediction equations possible regression equations using linear age and height were derived for both the diver and submariner groups for those aged more than 25 years These are given in *Table II* and demonstrate declines in FVC of 35 ml/year for divers and 42 ml/year for submariners

DISCUSSION

Assessment of ventilatory function in naval divers by means of simple spirometry is an annual procedure undertaken in an attempt to detect any condition that might cause retention and trapping of gas in the lungs in the event of rapid ascent from depth. An objective and standard method of interpretation is required which will permit a comparison of the observed and predicted measurements Several investigators have carried out extensive studies on normal populations and formulated predictive equations [5–10] Gliedmeyer in a paper aptly entitled Predictable Confusion compared the commonly used regression equations for predicting FVC FEV$_1$ and found that the variability between the rates of decline in ventilatory capacity with age were up to 45% for FEV$_1$ and 260% for FVC These differences undoubtedly arise due to differences in the population studied and the apparatus and measurement procedures used they highlight the need for predictive equations appropriate to the population being studied particularly in the case of such specialised subgroups as were investigated in this study

All the currently used predictive equations show height and age to be the most important factors in the determination of spirometric values though the exact relationship varies between studies [2] Inclusion of a quadratic age factor in our equations for FEV and FVC showed both of these variables to be still increasing at age 25 and starting to decline only in the mid thirties All 15 equations for FVC and 10 for FEV$_1$ quoted by Glindmeyer give a linear

Table II Ships divers and clearance divers

	Mean FVC(L)	Mean FEV (L)	FEV/FC(%)	Mean age (yrs)
Ships divers n = 148	5.73	4.67	81.5	21.1
Clearance divers n = 44	5.65	4.58	81.4	26.9

All values at BTPS

Table III Comparison of novice and experienced

	Mean FVC(L)	Mean FEV (L)	FEV/FC(%)	Mean age (yrs)
Novice n = 117	5.75	4.77	83.0	24.0
Experienced divers n = 75	5.68	4.53	80.0	31.7

All values at BTPS

Table IV Regression relationships for those aged more than 25 years

		Regression coefficients			
	Units	Stature	Age	Constant term	Group
FVC	L	0.042	−0.035	−7.89	Divers n = 115
FEV	L	0.061	−0.030	5.39	
FVC	L	0.068	−0.042	5.26	Submariners n = 150
FEV	L	0.056	−0.046	−4.06	

Age in years stature in cms

decline with age. If the average height and age for our combined groups are used (average height 178.6 cm average age 28.2 yrs) our linear equation gives an FVC of 5.73L and a mean rate of decline of 38 ml/year. If the quadratic age term is included in the analysis and using the ages and heights given by Glindmeyer (height 172.72 cm and ages 25 and 55 yrs) at age 25 our value of 5.30L is slightly greater than that of Morris[6] (5.15L) and Kumpfuroff[7] (5.17L) and somewhat lower than that of Berglund[1] (5.48L) but considerably higher than that predicted by any of the other equations quoted. At age 55 the situation is somewhat different. Our value of 3.53L is lower than any of the other predicted values. However due to the small numbers of subjects over the age of 40 in our study the accuracy of predictions at this end of the population is likely to be low.

We failed to show any effect of smoking in the combined group of subjects but the smoking submariners showed a significantly lower FEV_1/FVC ratio than non smoking submariners this may be due to the significantly smaller number of smokers in the diving group (31% smokers) compared with the submariners (46% smokers). It is also possible that smoking divers who exhibit decreased pulmonary function are less likely to remain divers because of their yearly medical examinations and because of the physical demands placed upon them.

The larger lung volumes found in the divers compared with the submariners could be the result of either selection or adaptation. Crosbie *et al*[4] reported larger lungs in North Sea divers than those expected in the normal population and contended that due to the nature of their work the divers

developed hypertrophy of the thoracic wall and diaphragm resulting in enlarged lungs.

Carey *et al*[3] in a one year longitudinal study of lung volumes in breath hold divers reported that all subdivisions of the lung were increased except for the residual volume which was diminished. Smart and Colliss[4] in their study of vital capacities and maximum breathing capacity in athletes and non-athletes were able to show significantly higher vital capacities in the athletes and suggested that this was due to increased development of the respiratory musculature as a result of regular physical training. Training of the shoulder girdle may also lead to an increase in the vital capacity[5] due to increased strength in the accessory muscles of respiration.

The physically demanding nature of a diver's work and the increased resistance to flow generated by underwater breathing apparatus particularly during exercise might lead to increased development of the respiratory musculature. If this is the case it could be expected that years diving and depth of diving would be reflected by greater lung volumes in the more experienced and deeper divers. This study failed to reveal any significant relationship between lung volumes and years diving in either deep or shallow water divers. This differs from the findings of Crosbie *et al*[2] that divers with 5–10 years experience had larger lungs than those with <5 years. However of the 182 divers tested in this study only 44 were clearance divers. This group were on average much younger and thus less experienced than the ships divers and it is suggested that any effect of repeated deep diving on lung volumes which may exist has been confounded by these two factors.

An interesting and significant finding of this study was that as the FVC increases above 100% of the predicted value the proportion of that FVC that can be expelled in one second tends to decrease. Crosbie *et al*[2] suggests that this may be due to the absence of a proportional increase in airway diameter and recoil forces rather than simple airway obstruction. He quotes a linear regression equation of $y = -0.177x + 102.1$ for his divers with FVCs greater than 100% of the predicted value of Kory *et al* where y = FEV/FVC ratio and x = Actual FVC/Predicted FVC %. Applying this same calculation to our divers aged more than 25 years we obtain the very similar equation $y = -0.168x + 100.8$. A comparable relationship is also obtained for the submariners who have no diving experience if our predictions are substituted for those of Kory *et al* then $y = -0.144x + 96.7$ and if the actual FVC is used instead of a predicted value then $y = -1.438$ FVC + 90.3. This implies that for a population whether an individual has diving experience or not the larger his FVC the lower his ratio will tend to be. This may be of particular importance to the Royal Navy as evaluating fitness to dive in that it may be that some divers who fail to reach the 75% FEV/FVC ratio standard because of disproportionally large lungs may be allowed to continue diving if further investigations reveal no pathology.

In conclusion the finding that as the vital capacities of some individuals exceed their predicted values there tends to be a decline in the FEV/FVC ratio gives cause to review the existing arbitrary regulations for assessment of fitness to dive.

The authors also feel that the predictive equations generated from this study are more appropriate to these naval populations than those currently used.

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Prescribing for the prevention of infective endocarditis: A study into the use of prophylactic antibiotics in the Armed Forces Dental Services

A. J. Woodman

Abstract

A review of the rationale for the use of antibiotic prophylaxis to prevent the effects of bacteraemia associated with dental treatment is presented with the background to the development of currently recommended high dose prescribing. The results of a survey within the Armed Services into the current use of antibiotic prophylaxis indicate a wide variety of prescribing schedules mostly considered effective by accepted standards. However the use of antibiotics when penicillin hypersensitivity exists was often essential with doses considered ineffective against *Staphylococcus*. The readiness to prescribe repeated prophylaxis was indicative of a lack of awareness of the problems of resistance within the Services for oral prophylaxis which was provided for most medical conditions in a responsible manner. Most replies indicated that there was room for improvement in communication between the patient and medical and dental practitioners regarding the dental involvement in infective endocarditis.

INTRODUCTION

THE use of prophylactic antibiotics during dental treatment is regarded as mandatory for certain patients considered susceptible to infective endocarditis because of underlying cardiac disease or abnormality. The role played by dental disease and treatment in the aetiology of infective endocarditis remains circumstantial in man but has been proven in animal experiments where both direct inoculation of oral streptococci and dental manipulation under perfusion of such streptococci have been shown to result, via bacteraemia in colonisation of the damaged endocardium of specially prepared rabbits and establishment of infective endocarditis. As oral organisms particularly oral streptococci are frequent isolates from cases of infective endocarditis in man the implications are that dental treatment or disease may induce a bacteraemia sufficient to colonise the altered heart tissue of the susceptible patient.

INFECTIVE ENDOCARDITIS

Susceptibility to infective endocarditis is associated with the presence of altered heart tissue following rheumatic fever congenital heart disease atrioseptal defects, the placement of cardiac valvular prostheses or mitral and aortic valve degeneration in the elderly.[1] However between 18% and 31% of cases have been reported to occur in hearts with no previously known or suspected abnormality.[2,3] It is a relatively uncommon disease, less than 1000 cases being reported annually in England and Wales,[4] but has a mortality of around 30% due to cardiac failure, systemic effects from emboli or locally destructive effects of the microbial colonisation.[5] In the pre-antibiotic era, mortality was 100% and the majority of cases occurred in younger patients with a history of rheumatic heart disease, or congenital defects, however with the improvement in medical and surgical techniques for the treatment and repair of cardiac conditions there has been a change towards a greater proportion of cases being found in the elderly. Oakley[6] suggests the increase in the provision of cardiac prostheses and the longer survival of patients with degenerative heart conditions has influenced the age-susceptibility to infective endocarditis. Cawson[7] reports that chronic alcoholism and immunosuppressive therapy are linked with the disease but

regards the mortality from endocarditis associated with dental treatment and oral organisms as only 10%, compared with the 25% observed by Voglet [14]. Those patients having a cardiac prosthesis are most at risk and have been associated with a mortality of 66% [6].

Oral bacteria isolated from cases of infective endocarditis are most frequently *Streptococcus mitior* and *Streptococcus sanguis* the α haemolytic members of the viridans group of streptococci widely distributed within dental plaque saliva and on oral mucosal surfaces to which they have an affinity. However the non-haemolytic viridans streptococci *S. milleri S. mutans* and *S. salivarius* are less frequent isolates as are species of Bacteroides and Veillonella. Occasional reports have described the isolation of *Candida albicans*[8] and *Actinobacillus actinomycetemcomitans* [6]. The gut streptococci *S. faecalis* and *S. bovis*, implicated in infective endocarditis of gastro-enteric or genito-urinary origin are occasionally found in the mouth particularly on silk sutures in post surgical periods [9].

Bacteraemia during dental treatment has been well documented since the work of Okell and Elliott in 1935 [7] various authors having reported the incidence of bacteraemia associated with dental procedures. Robinson *et al*[16] found bacteraemia in 39% of patients after a single extraction and in 73% after multiple extractions. whilst McGowan[15] quotes 100% bacteraemia after extraction. Periodontal treatment has been reported to result in bacteraemia after subgingival instrumentation in 83% of patients by Korn *et al*[20] in 73% by Bandt *et al*[1] and in 51% by Connor *et al*[3]. Ultrasonic scaling has been shown to be associated with bacteraemia in 50% of patients [3] and snaking in the presence of apparently healthy gingivae caused bacteraemia in 21% of patients examined by Connor *et al* [3] who were able to associate increased incidence of bacteraemia with poor periodontal health in their subjects. McGowan[15] reported that endodontic instrumentation within the tooth showed bacteraemia in 33% of patients, yet instrumentation beyond the tooth apex caused bacteraemia in 31% apicectomy showed bacteraemia in 33.3% and a full periosteal flap procedure 83.3%.

That susceptible patients, with a known cardiac history are in need of such dental treatment has been established by studies which have shown a poor awareness of the value of dental health within the at risk population many of whom attended the dentist for the relief of pain only [4]. Most of these patients had received little or no advice regarding the importance of dental health in their medically compromised condition and few had ever had a medical history taken before dental treatment. [6] Many dentists questioned in Scotland by Holbrook, Willey and Shaw[17] felt that they were poorly advised by both patient and medical colleagues about the cardiac condition of their patients.

ANTIBIOTIC PROPHYLAXIS

The advent of antibiotics heralded the institution of many recommendations for their prophylactic use to protect the at risk patient from the consequences of a post-operative bacteraemia. McGowan [6] in a review of prescribing regimes from 1945 to 1971 found great variation in the use of penicillin for prophylaxis against infective endocarditis the drug being given intramuscularly as a single dose or orally for up to one week both before and after treatment. A long duration of the antibiotic regime believed to increase the likelihood of development of antibiotic resistance to the oral flora, was discouraged in 1965 and again in 1972 by the American Heart Association[20] who recommended, for adult patients not hypersensitive to penicillin, that a single intramuscular injection of 600 000 units of benzylpenicillin should be given 30 minutes before dental treatment, followed by 250–500 mg oral phenoxymethylpenicillin six hourly for 48 hours. For those not able to receive penicillin, erythromycin was substituted and children had similar weight related doses.

The validity of current prescribing regimes was questioned in a series of experiments undertaken by Dajcar and co-workers commenced in 1972. Various drugs and doses were compared in rabbits in which the endocardium had been damaged by intracardiac catheterisation to simulate a heart susceptible to microbial colonisation and infective endocarditis then subjected to inoculation of known volumes of streptococci (*S. sanguis*) [9, 11]. Their conclusions were that bacteriostatic drugs were ineffective as prophylactics, particularly tetracycline and that most bactericidal drugs used singly via the intramuscular route were incompletely effective in preventing the development of an endocarditis in the prepared rabbits. However combinations of benzylpenicillin and streptomycin benzylpenicillin and bacitracin penicillin even effective intramuscularly as was intravenous vancomycin. When doses comparable to human doses were observed under the same conditions only intravenous vancomycin and intramuscular benzylpenicillin with streptomycin completely prevented endocarditis and erythromycin was effective against small inocula only [4]. The oral penicillin observed in that study only consistently prevented endocarditis when a high loading dose of

30 mg/kg was administered before bacteraemia and followed by 7.5 mg/kg six hourly for 48 hours. As a result of these observations the American Heart Association modified their recommended prophylaxis regimes to include the high loading dose before treatment. Thus for adult patients not hypersensitive to penicillin the recommendations for oral prophylaxis were modified to 2G phenoxymethylpenicillin 30 minutes to one hour before treatment followed by 500 mg phenoxymethylpenicillin six hourly for 48 hours. Erythromycin is substituted for the penicillin sensitive patient, 1G initially followed by 500 mg six hourly for 48 hours. Weight related doses are recommended for children needing prophylaxis. The highest risk patients, who have cardiac prostheses or have had a previous bout of endocarditis are considered by the AHA not to be adequately protected by oral prophylaxis and in regards both prophylaxis and hospitalisation desirable, using either intravenous vancomycin or intramuscular benzylpenicillin with streptomycin. These recommendations have been accepted as the basis of prophylaxis by many countries other than the USA for example Sweden[24] Australia[25] and New Zealand.

The need for post-operative antibiotic within the prophylaxis regime[26] and the degree of compliance with this by the patient[27,28] have been questioned. Oakley[29,30] has repeatedly stated that there is a need for a simple effective one dose prophylaxis for dental treatment of the at risk patient which removes the need for accurate observation of patient cooperation after treatment, yet achieves and maintains a high serum level during the period of risk from bacteraemia and minimises the development of resistant strains of bacteria. For this purpose a single 3G oral dose of amoxycillin has been proposed either as a flavoured suspension or dispersible tablets in water[31,32]. Some authorities regard a second 3G dose eight hours later desirable for complete protection[33]. Amoxycillin has been shown to achieve higher serum levels maintained for longer and have a wider spectrum of antibacterial activity than similar doses of penicillin or ampicillin to which it is closely related being particularly effective against the oral organisms implicated in infective endocarditis[34,35].

Most authorities recommend that the frequency of treatment under prophylaxis as eg the same antibiotic should allow intervals of at least one month to avoid complications from resistant flora reduced by prior doses of the drug[36]. However observations in health volunteers showed no measurable change in the antibiotic sensitivity of oral bacteria following a single 3G dose of amoxycillin suggesting that repeat prophylaxis would be safe and effective[37]. When the dose was repeated on four successive days there was a steady increase in resistance to the drug equivalent to a failure of such prophylaxis[38].

In spite of the availability of advice regarding prophylaxis regimes surveys of the prescribing habits of dentists have shown that the high loading dose has not been adopted by many practitioners. Brooks[39] observed that 77% of dentists in Michigan USA approved of the AHA recommendations for prophylaxis but only 14.5% actually employed them most preferring a four day course of low dose oral penicillin. In the United Kingdom the findings of Dimick in Oxfordshire in 1975 before the high dose prescribing was widely recommended in which a four day course of penicillin often commencing one or two days before treatment was favoured, were echoed in Scotland by the study of Holbrook, Willey and Shaw in 1983[40] who noted that their observations were taken before the use of amoxycillin was widely recommended.

The present study was undertaken to assess the prescribing habits of dental officers serving in the Armed Forces where oral prophylaxis is considered necessary for patients at risk from infective endocarditis.

MATERIAL AND METHOD

One hundred and fifty questionnaires were distributed within the Armed Forces Dental Services by random distribution to dental officers working within a general practice situation being unknown to the author. Fifty questionnaires were allocated to each of the Royal Naval Dental Service, Royal Army Dental Corps and Royal Air Force Dental Branch.

The questionnaire contained six sections which were designed to determine

1. which medical conditions were considered to warrant antibiotic prophylaxis for dental treatment
2. which antibiotic regime was preferred for prophylaxis for a patient not hypersensitive to penicillin
3. which antibiotic regime was preferred for patients known to be hypersensitive to penicillin
4. the frequency with which prophylaxis should be repeated
5. whether repeated prophylaxis could be undertaken with the same drug,
6. whether the dental officer felt his patients were aware of the value of dental health and the risks of dental treatment in their particular circumstances.

The questionnaires were completed anonymously and 125 (83.3%) were returned.

Table I Question 1 For which of the conditions listed would you consider antibiotic prophylaxis desirable when bacteraemia might be anticipated in the dental surgery?

A history of	*% Yes*	*% No*	*% Uncertain*
Rheumatic fever	84	8	0
Rheumatic heart disease	100	0	0
Congenital heart defect	93	5	2
Heart murmur	82	38	12
Coronary artery disease	16	77	7
Angina	12	82	6
Prosthetic valve placement	99	0	1
Mitral valve stenosis	82	14	4
Aortic valve stenosis	79	16	5
Renal dialysis	34	52	14
Immunosuppressive drug therapy	64	30	6
Diabetes	33	61	6
Systemic steroid therapy	25	68	10
Prosthetic hip replacement	38	55	9

Note total n's were 125 however some respondents did not complete each section of the question Percentages have been used to avoid confusion from the varying totals per section

Table II Choice of drug for prophylaxis and route of administration

Drug	*%*	*% Oral*	*% IM*
Penicillin	36	15	21
Amoxycillin	59	53	nil
Ampicillin	4	4	nil
Penicillin/Vi	1	1	nil
Total	*100*	*73*	*21*

n = 125

analysis The detail of the questionnaire is described with the results

RESULTS

The response to **Question 1** regarding the conditions considered to warrant antibiotic cover for dental treatment, is described in *Table I* Where the reply was uncertain many respondents stated that they would seek medical advice before reaching a decision

Question 2 sought the preferred antibiotic regimen for patients not having a general anaesthetic and not known to be hypersensitive to penicillin Respondents were asked to state their choice of drug, route of administration dosage and duration of therapy before and after treatment All the 125 replies indicated a preference for one of the penicillin group of drugs 79% using an oral regimen Of those amoxycillin was the most favoured (59%) by the oral route and intramuscular penicillins (21%) more popular than oral penicillin preparations (15%) as described in *Table II*

The dosage and duration of therapy was found to be much more variable than the choice of drugs indeed so few as 20 distinct oral regimens were elicited from the replies For clarity these have been grouped into drug type high or low dosage and duration for presentation in *Table III* for the oral drugs and *Table IV* for those given intramuscularly

Question 3 was directed towards the choice of alternative regimens for the patient known to be sensitive to penicillin The overwhelming majority of respondents chose erythromycin, however the replies showed a wide variation in the dosages used and the duration of therapy over 20 different combinations were identifiable which have been grouped for clarity in *Table I* Only two respondents preferred to use intramuscular or intravenous antibiotics in this situation

Question 4 asked what interval would be left between appointments requiring antibiotic cover when extensive treatment was contemplated over a series of visits to the dental surgery Forty eight per cent of the 120 replies to this question stated that at least four weeks would be allowed between visits, whereas 26% were prepared to repeat prophylaxis within one week of the initial appointment. The results are shown in *Table V*

In **Question 5** respondents were asked then

Table III Dosage and duration of oral prophylaxis regimes

Drug	*Pre treatment* Dose	Duration		*Post treatment* Dose	Duration	
Phenoxymethylpenicillin (V)	2G	1 hour	i)	2G qds		1
			ii)	500 mg qds		4
	500 mg	2 hrs		250/500 mg qds		1
	500 mg qds	1 day		250/500 mg qds		2
	250 mg qds	1–2 days		250/500 mg qds		6
Amoxycillin	3G	½–1 hr	i)	nil		58
			ii)	3G		5
			iii)	250–500 mg qds		2
	250 mg tds	1–2 days		250 mg qds		2
Ampicillin	250 mg qds	1 day		250 mg qds		1
	250 mg qds	1–2 days		250 mg qds		3
	250 mg qds	6–7 days		nil		1
Phenethicillin	500 mg	1 hour		250 mg qds	5 days	1
Amoxycillin with Penicillin V	3G (Amox.)	1 hr		250/500 mg qds (Pen V)	3–4 days	1
					Total	100

n = 99

Table IV Dosage and duration of intramuscular prophylaxis regimens

Drug	*Pre treatment*	*Post treatment*		
Tiaplopen	1 megaunit	nil	6	23
Benethamine penicillin and procaine penicillin and benzylpenicillin)	½–1 hour before	ii) 250–500 mg Pen V 2–3 days	7	11.6
Benzylpenicillin	1 megaunit ½–1 hour before	i) 250/500 mg Pen V 1–2 days qds	7	22
		ii) 250–500 mg Pen V 3–7 days qds	6	23
		iii) 500 mg Ampicillin 4 days qds	1	
Procaine penicillin	1 megaunit ½–1 hour before	nil	3	11.5
		Total	29	100

Note The use of the term megaunit is no longer common prescribing practice, however it is used here because it was used by the respondents in this question. One megaunit represents 600 mg

approach to prophylaxis within an eight week interval when clinical conditions demanded repeated treatment. They were asked whether they would prescribe (a) the same antibiotic (b) a different antibiotic or (c) consider a clearance and the provision of full dentures. The majority chose to use a different antibiotic (74%) and 48% stated that they would definitely not consider the provision of full dentures a long term solution as shown in *Table III*.

The final question was addressed towards the awareness of the at risk patient of his dental health and its possible complications with underlying medical conditions. It was obvious from the replies that in the opinion of many dental officers patients are not well informed of their status but, in spite of that would accept the provision of prophylactic drugs on the recommendation of their dental surgeon. *Table IIII* shows the full details of the replies to **Question 6**

...ce of penicillin. Choice of drug, dosage and duration of therapy

	Past treatment			
	Dose	Duration	n	%
Erythromycin (Oral)	[illegible]	[illegible]	250/500 mg qds 1–3 days	13	10·5
			oil	4	3
	[illegible]	[illegible]	500 mg qds 1–2 days	28	23
			250/500 mg qds 2–5 days	12	10
	[illegible]	[illegible]	250 mg qds 2–4 days	4	3
	500 mg [illegible]	[illegible]	250/500 mg 3–5 days	23	18·5
			et	1	1
	500 mg 24 hours before		250 mg qds 4 days	3	2·5
	250 mg qds for 24 hours		250 mg qds 1–4 days	16	13
	250 mg qds 5 days before		et	1	1
			Total erythromycin	105	84
Tetracycline (Oral)	250 mg qds 2–3 days		250 mg qds 3–5 days	3	2·5
Cephaloridine (IM)	1G		et	2	1·5
Vancomycin (IV)	1G		Oral Erythromycin 250 mg qds 2 days	2	1·5
Streptomycin	not		stated	1	1
Amoxycillin	3G ½–1 hour before		n/l	1	1
Ulcerectin				10	7
			Total	125	100%

Note. Percentages are rounded to nearest 0.5%

Table VI Quest on 4 If a patient required extensive treatment under prophylaxis which could not be completed in one visit, what interval would you leave between appointments requiring prophylactic antibiotic cover?

Time interval	%	*n*
Less than 1 week	26	32
1–2 weeks	8	9
2–4 weeks	18	21
4–8 weeks	42	51
Over 8 weeks	6	7
Total	100	120

DISCUSSION

The distribution of the survey was limited to dental officers in general practice posts and determined by a third party in each service the random choice of participants being unknown to the author The scope of the questions was limited but the clarity of the replies indicated that the majority of respondents had a clear understanding of the questions Indeed many unsolicited replies were forthcoming which showed a genuine interest in the topic The proportion of completed questionnaires 125 out of 150 (83·3%) was less than might have been expected from within a service environment, however it is considerably greater than similar studies Durack based his findings on 71 replies from 117 dentists in Oxfordshire (67%) in 1975 and, more recently Holbrook, Willey and Shaw[37] reported on 169 replies (61% of original participants) in Scotland in 1983

Question 1

Many respondents sought medical advice before the use of prophylactic antibiotics however the majority were in agreement regarding the need to provide cover for the most serious conditions, rheumatic heart disease, congenital heart disease, cardiac prostheses and valvular degeneration Ninety four per cent were prepared to give antibiotics for patients with a history of rheumatic fever without reference to the presence of underlying cardiac abnormality which may or may not follow the disease There was less agreement about the need to protect those with a heart murmur many of the respondents added that they would seek a specialist medical opinion Most of the replies reiterated that angina or coronary artery disease did not deserve prophylaxis which reflects current recommendations[4] Renal dialysis patients, admittedly not likely to be found in service

Table VII Question 5 If repeated treatment (after an initial prophylaxis provided within an eight week interval) would you a) use the same antibiotic, b) use a different antibiotic, c) consider a clearance and the provision of full dentures?

	Yes					
a) use the same antibiotic?	26%	(31)				
b) use different antibiotic?	74%	(89)				
Total	100%	(120)				
	No		*Possibly*		*No reply*	
c) consider a clearance and F/F?	48%	(58)	20%	(24)	32%	(39)

n = 120

Table VIII Question 6 Do you think that your susceptible patients

	Yes		*Some*		*No*	
a) Are aware of the risks of dental treatment?	18%	(22)	66%	(80)	16%	(19)
b) Are aware of the importance of dental health in their medical circumstances?	7%	(9)	68%	(82)	25%	(31)
c) Have been advised of the dental implications by GMP or cardiologist?	24%	(29)	60%	(73)	16%	(19)
d) Regard your prophylaxis never as a nuisance or unnecessary?	11%	(14)	46%	(56)	43%	(51)

n = 121

practices were not considered to warrant prophylaxis by 52% of the replies yet Campbell McGowan and Macfarlane[4] recently reported such patients at considerable risk from increased numbers of enterococci in the oral cavity when dentistry is performed. Diabetics although frequently prescribed antibiotics to reduce postoperative infection, are not at special risk unless underlying cardiac problems are present. 61% of respondents recognised this. Bacteraemia has been cited as a cause of failure of prosthetic hip replacement, yet only 36% wished to prevent the patient from such an event by providing antibiotic prophylaxis

Question 2

The penicillin group of drugs remain first choice for prophylaxis when there is no history of hypersensitivity however there appears to be a greater use of the semi synthetic penicillins ampicillin and amoxycillin than in previous studies Dimick[5] found 93% in favour of penicillin in 1975 Holbrook et al[2] whose report was compiled before the wide use of amoxycillin found 86% using penicillin prophylaxis whilst in this present study only 36% chose penicillin compared to 59% preferring amoxycillin exclusively by the oral route

Few replies indicated a preference for intramuscular administration of the antibiotic but most of the regimens quoted were acceptable to current recommendations[1,3,4] although 34.5% did not prescribe post treatment oral antibiotic still considered by the AHA to be desirable.

The variability of the oral prescribing reflects the previous studies when drugs other than amoxycillin are considered. Many courses of antibiotics are still being given for two or more days before treatment or for two or more days after treatment, as was found by Dimick[5] and Holbrook *et al*[2] In spite of a trend towards short duration high dose prescribing, 28% still preferred post treatment antibiotics to exceed two days and those using other than amoxycillin used low dose therapy only 7% prescribing an oral regimen consistent with current recommendations for oral penicillin However the large number of respondents preferring amoxycillin was affirmative in providing a total of 79% of persons using a regimen approved by current recommendations[1,3,4]

Question 3

In previous studies there was a marked use of tetracyclines for prophylaxis when the patient was hypersensitive to penicillin. However bacteriostatic drugs have since been shown to be ineffective in the animal studies of Dersack and co-workers. These it was reassuring to find that there were only three respondents who advocated tetracycline in the present study the majority preferring to use erythromycin (84%). One respondent clearly did not realise the potential hazard of using amoxycillin for such hypersensitive patients as it is of course a penicillin and hypersensitivity reactions may be expected from any of that group of drugs.

The dependence upon erythromycin for the penicillin hypersensitive patient is only considered safe if high dose therapy is used[1,2,3]. Durrack[4] having found that the equivalent of 1.5G was essential for the production of bactericidal levels in the serum. Regrettably the organisms quoted in this study often fell short of such a loading dose of the 84% using the drug some 46% were advocating high dose therapy. A further 3% used a safe intravenous or intramuscular regimen, possibly impractical in the dental surgery thus barely half the prescribing for penicillin hypersensitive patients would be considered effective by current recommendations a disappointing finding.

Question 4

When asked to repeat prophylaxis 48% stated they would wait for a month or more as is currently recommended to avoid complications from resistant bacteria the remainder were prepared to perform more treatment under antibiotic cover even within a week (26%). However as susceptible patients have been shown to have high levels of naturally occurring resistant bacteria[5] and as repeat of the 3G oral dose of amoxycillin is associated with an increasing proportion of resistant bacteria[2,3] the frequent repeat of prophylaxis cannot be considered safe within a month from the first dose.

Question 5

When repeated treatment was necessary within a two month period most respondents stated that they would choose another antibiotic (74%). However it would be necessary to change from the penicillin group completely to avoid the problem of cross resistance and the response to Question 3 concerning alternative drugs would suggest that many patients would then receive an ineffective regimen placing them at risk for subsequent dental treatment.

Only 20% were prepared to consider a full clearance and the provision of full dentures as a solution to extensive treatment needs which might have been considered unacceptable in the past. Infective endocarditis of suspected oral origin has been reported in the edentulous[6] and also to be more likely to recur in sufferers who had teeth removed after one episode of the disease.[7] No doubt the replies to this question were influenced by the general trend in dental treatment away from tooth loss and towards conservation.

Question 6

The attitudes and awareness of susceptible patients as considered by their dental officers showed similar results to reports of the dental and medical aspects of such patients in other studies[4,8]. It would appear that more stress needs to be placed on the preventive aspect of dental treatment for the particular needs of these patients not only by the dentist but by the medical practitioner or specialist responsible for the patient's cardiac condition. A general improvement in dental and oral health with carefully monitored maintenance would be of lasting benefit when dental treatment is undertaken maintaining the bacterial population and potential bacteraemia.

SUMMARY

The results of this study within the Armed Forces indicate that the majority of patients requiring antibiotic prophylaxis during dental treatment, due to underlying susceptibility to infective endocarditis, are prescribed a safe and effective drug regimen for their defence against bacteraemia. It is equally obvious, however that doubt exists in the minds of many prescribers as to the best management of patients hypersensitive to the penicillins many using antibiotics in low dosages which are below the levels of those recommended by most authorities for effective protection against the effects of bacteraemia. Some conflict of opinion was found regarding the interval which should be allowed to elapse between repeated prophylaxis slightly more than half of the respondents being prepared to repeat prophylaxis within the one month interval currently considered desirable. However of those who were forced for clinical reasons to repeat treatment, a definite majority stated that they would change their prophylactic antibiotic, but effective substitutes for the penicillins, the most favoured drugs were quoted by only half of the respondents.

There would seem to be room for improvement in the levels of awareness of both susceptible patient and medical practitioner towards dental health and the hazards of its neglect and better communication between them and the dentist. A careful medical

history may reveal the possible susceptible patient who has not been made aware of his status and should be an integral part of the examination of all new dental patients. Discovery of cardiac anomalies by the medical team should automatically be reported on the patient's dental records when they are considered severe enough to expose the patient to the risk of developing infective endocarditis from bacteraemia, either from dental or other invasive medical techniques.

CONCLUSIONS

1 Antibiotic prophylaxis against infective endocarditis is used within the Armed Forced Dental Services in a responsible manner for those medical conditions likely to be encountered in the Services.

2 When a penicillin-based drug may be prescribed the majority of prophylactic regimens used are effective by current standards.

3 When alternative drugs for penicillin hypersensitive patients are prescribed, only half of the prescribers used antibiotic regimens considered effective against bacteraemia by current standards.

4 High dose oral amoxycillin is widely used for single-dose prophylaxis.

5 Repeat of prophylaxis within one month where clinically dictated is likely to be performed with a different antibiotic but using an ineffective dose.

6 Communication between the patient, dentist and medical practitioner with regard to the importance of dental health in susceptible patients needs encouragement.

Current recommendations for endocarditis prophylaxis for dental procedures

From the report of a Working Party of the British Society for Antimicrobial Chemotherapy, first published in the *Lancet* in 1982 [4]:

For patients not receiving a general anaesthetic

a 3G oral amoxycillin one hour before treatment or

b. 1·5G oral erythromycin one hour before treatment plus 500 mg oral erythromycin six hours later when hypersensitive to the penicillins.

For patients treated under a general anaesthetic

c 1G amoxycillin intramuscularly immediately before treatment plus 500 mg oral or IM amoxycillin six hours later.

For patients in the high risk category (eg prosthetic valve patients)

d 1G amoxycillin intramuscularly with 120 mg gentamicin followed by 500 mg amoxycillin intramuscularly after six hours.

For patients in the high risk category (eg prosthetic valve patients) undergoing dental treatment under general anaesthesia or in the high risk category

e 1G vancomycin intravenously followed by 120 mg gentamicin intravenously immediately prior to treatment.

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Bilateral inguinal herniae—a reappraisal of dogma

J O Soul and E P Dewar

Summary

[illegible] results. [illegible] a retrospective study have indicated that [illegible] contrary to popular teaching there is no evidence that [illegible] have [illegible] an increase in the post operative morbidity [illegible] bilateral inguinal hernia repair as compared with one operation. This should be investigated by a prospective randomised study

INTRODUCTION

Dogma has been the fundamental principle of religion

Cardinal Newman

THERE has been a substantive impression that the morbidity associated with bilateral inguinal hernia repair carried out either synchronously or consecutively under the same anaesthetic is greater than that following unilateral repair. It is difficult to find previous literature to suggest that this should be so but surgical dogma of the past has taught that patients with bilateral hernias should have them repaired singly with a interval between operations. This philosophy is also current teaching.

In order to investigate this impression a retrospective survey has been carried out at the Royal Naval Hospital Haslar to compare the post operative progress of patients subjected to bilateral inguinal hernia repair with a similar group of patients who had undergone unilateral inguinal hernia repair.

PATIENTS AND METHODS

During 1982 and in the first six months of 1983 31 patients underwent bilateral inguinal hernia repair either carried out synchronously by two surgeons or consecutively by one surgeon under the same anaesthetic. During the same period 176 patients underwent unilateral inguinal hernia repair. The 31 patients were matched for age, sex, and the ward on which they were nursed with 31 of the 176 patients in the unilateral repair group. Where more than one patient in the unilateral group fulfilled the qualifications required for a match with a patient in the bilateral group a patient was selected at random from those qualified.

An analysis was carried out of the operative procedures, the incidence of wound infection and the duration of stay in hospital of patients in the two groups and the results were compared.

RESULTS

The two groups were comparable with respect to age, sex, and the ward on which they were nursed by design. There was no difference between the two groups with regard to the grade of surgeons performing the operations. The groups were also well matched for the type of repair carried out, the type of skin sutures used, and the presence or absence of drains. (*Table I*)

Table I Operative details

	Unilateral	*Bilateral*
Repair		
Bassini	24	25
Darn	6	5
Other	1	0
Skin suture		
Nylon	11	12
Dermalene	8	6
Silk	7	9
Clips	0	2
Other	5	2
Drains		
Present	2	3
Absent	29	28

Wound infection

Wound infection was classified as the presence of erythema, with or without a wound discharge, of pus, or wound breakdown, at any time during the patient's hospital stay or until the sutures were removed. The presence of pus or wound breakdown were deemed serious infections.

Of the 31 patients selected from the unilateral repair group, three developed a wound infection according to our definition, an incidence of 9·6%. Only one of these developed pus, an incidence of serious infection of 3·2%. In the bilateral group eight patients developed a wound infection, an incidence of 25·8%. Serious infection with pus and in one case wound breakdown occurred in four, an incidence of 12·9% (*Table II*).

Although there was clearly a greater incidence of wound infection in those patients undergoing bilateral inguinal hernia repair, the difference was not statistically significant using the Chi test either for the total number of infected cases or for serious infections.

Table II. Incidence of infection

	Unilateral	*Bilateral*
Serious (%)	1 (3·2)	4 (12·9)
Total (%)	3 (9·7)	8 (25·8)

Length of hospital stay

The 23 patients in the bilateral group who had clean wounds required to stay in hospital for longer (6·7 days) than those with clean unilateral wounds (4·9 days). Similarly, when the wounds became infected those with bilateral hernia repairs required to stay in hospital for longer (12·0 days) than those with infected unilateral wounds (10·3 days) (*Table III*). None of these differences is statistically significant.

Table III. Length of hospital stay

	Unilateral	*Bilateral*
Clean (± SD)	4·9 (1·5)	6·7 (2·2)
Infected (± SD)	10·3 (3·8)	12·0 (7·7)

DISCUSSION

Reported infection rates for unilateral inguinal hernia repairs vary from 5% to 9·8%, which is in accord with our experience both in this survey and previously.[3] It has usually been stated that the [illegible] rate is higher in bilaterally [illegible] there is little evidence to support this [illegible] in 1967 described a technique [illegible] repair of bilateral hernias [illegible] used a small series of 10 patients [illegible] infection rate of 10%.[5]

We here show a non-significant increase in the infection rate in bilateral hernias (8 out of 31) compared with unilateral hernias (3 out of 31). These figures refer to patients rather than hernias and if the incidence is examined in terms of hernias repaired then the figures become comparable (3/31 compared with 8/62). This pre-supposes that each individual hernia repair has an equal chance statistically of becoming infected. In the case of a bilateral hernia repair this may not be so.

The most significant finding in this survey has been the difference in the two groups comparing the length of time spent in hospital. From this study a patient with a bilateral repair and clean wounds spends an average of 6·7 days in hospital. If that patient were to have each hernia repaired individually then he would spend an average of 9·8 days as an inpatient. In the latter case he would also be subjected to two hospital admissions, two anaesthetics, two postoperative periods and two convalescent periods off work.

Even if the patient with the bilateral hernia were to develop a wound infection, he would only spend an average of 2·2 days longer in hospital (12·0 days) than if the hernias were repaired individually (9·8 days).

It has not been possible in this study to investigate the morbidity associated with these factors but clearly two anaesthetics carry a higher risk than one, especially in the age group of patients prone to develop bilateral inguinal hernias. In our study 70% of the patients in the bilateral group were over 50.

The retrospective nature of this study also precluded any investigation into recurrence rates or the time spent off work by the two groups and in our experience this is a very variable period.[4] In line with current Naval policy all those patients in the bilateral group who were active servicemen were returned to full duty after the same period (3 weeks) as those in the unilateral group and were fully capable of performing all tasks required of them. The early return to work of these patients, whose destiny is controlled by the Naval surgeon, would indicate that no greater convalescence is required after bilateral repair than after unilateral repair.

CONCLUSION

We have not been able to demonstrate a significant difference in the rate of infection or length of

hospital stay between patients undergoing unilateral inguinal hernia repair or bilateral repair. We have, however, in this retrospective survey highlighted those aspects of this dilemma which should be further investigated in a prospective study since a change in policy would result in a considerable financial saving to the NHS. We might also have to disagree with Cardinal Newman who said,

Dogma has been the fundamental principle of my religion. I cannot enter into the idea of any other religion.

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Primary adrenal carcinoma as a cause of non metastatic hepatosplenomegaly and liver dysfunction syndrome

B Conroy

INTRODUCTION

STAUFFER in 1961 first described the phenomenon of unexplained hepatosplenomegaly and liver dysfunction associated with renal cell carcinoma in the absence of metastatic spread to the liver that disappeared following surgical resection of the neoplasm. A subsequent review of multiple similar patients and reports of cases associated with other forms of renal pathology have led to the introduction of the terms nephrogenic hepatosplenomegaly and nephrogenic hepatic dysfunction. This paper describes hepatosplenomegaly with non specific liver biopsy abnormalities and dysfunction in a patient who subsequently proved to have metastasising adrenal carcinoma without liver involvement. It is suggested that hepatomegaly and liver dysfunction with or without splenomegaly may occur in association with carcinomas outside the renal tract and that its presence per se does not indicate metastatic involvement of the liver.

CASE REPORT

The patient a 55 year old Caucasian man first presented with several weeks' history of anorexia, weight loss night sweats malaise and vomiting. On clinical examination he had a sallow complexion but was afebrile. His liver was smoothly enlarged to two finger breadths below the costal margin and was slightly tender. This enlargement was confirmed by ultrasound examination. Initial investigations revealed the following results:

ESR 118 mm/hr Hb 11.6 g/dl PCV 0.349 WBC 12×10^9/l bilirubin 11 μmol/l alkaline phosphatase* 1320 IU (20–100 IU)* albumin 30 g/l (36–50 g/l)* AST 31 IU (0–30 IU)* GGTP 303 IU (7–42 IU)*

*Normal values
†Severe hepatocellular characteristic of advanced liver disease

Urinalysis demonstrated +++ bilirubin and an excess of robilinogen. Antibody screen and HBsAg examination were negative. Serum protein electrophoresis revealed a pattern compatible with liver disease. Needle liver biopsy was performed and showed only non specific moderate steatosis and mild hepatitis (Fig. 1). Steinscan confirmed that there was no filling defect. Intravenous urography was within normal limits. A Synacthen test was normal.

His symptoms persisted and eight months later an exploratory laparotomy was undertaken. The only abnormal finding was of a smoothly enlarged

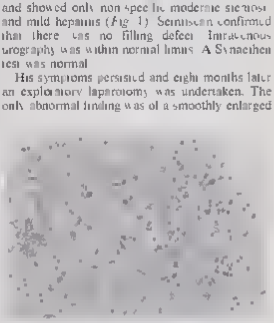

Fig. 1 Section of the initial needle liver biopsy demonstrating mild steatosis and patchy inflammation (H & E ×160).

[illegible] Repeat [illegible] biopsy of the liver again showed only non-specific mild steatosis and inflammatory change. Several days following operation he developed right hemiparesis with positive romberg sign. CAT cerebral scan demonstrated multiple space occupying lesions in both cerebral hemispheres and cerebellum. Despite supportive measures he steadily deteriorated and died approximately one month later.

Necropsy findings

The left adrenal gland obscured by the enlarged spleen was found to be completely replaced by a circumscribed encapsulated haemorrhagic mass weighing 320 g and measuring 8 × 6 × 4 cm. This was entirely separated from the compressed subjacent kidney by its capsule. The right adrenal gland showed no naked eye abnormalities. Multiple haemorrhagic nodules were present in both cerebral hemispheres, cerebellum and pons with accompanying cerebral oedema. A single enlarged lymph node extensively replaced by metastatic neoplasm was found at the hilum of the left lung. No other neoplastic deposits were identified, particularly in relation to the liver and spleen or in either lung despite very thorough examination of these organs. Histological assessment of the adrenal mass revealed a haemorrhagic necrotic pleomorphic lesion fully consistent with a primary adrenal carcinoma (*Fig. 2*). The haemorrhagic nodules in the brain and the left hilar lymph node demonstrated features of metastatic carcinoma. Liver histology again showed only mild steatosis without any evidence of metastasis and the spleen was congested.

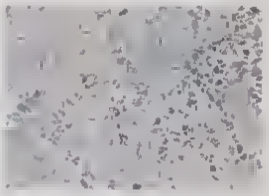

Fig. 2 Section of the adrenal carcinoma illustrating the pleomorphic nature of the lesion (H & E ×)

DISCUSSION

Non metastatic hepatosplenomegaly with liver dysfunction syndrome related to underlying malignancy is an uncommon, rather poorly defined but apparently distinct entity of unknown aetiology. The most comprehensive account of the condition is provided by Strickland and Schenker[1] who reviewed in detail 29 well documented examples. Their diagnostic criteria involved excluding metastatic spread to the liver by the use of scans, biopsy and/or thorough examination at necropsy associated with reversal of liver dysfunction where surgical resection of the neoplasm proved feasible.

The useful clinical and laboratory findings include hepatomegaly with or without splenomegaly, weight loss, fever and anaemia together with elevated alkaline phosphatase levels and prolonged prothrombin time. It has been suggested that the alkaline phosphatase may in some instances be produced by the underlying carcinoma although isoenzyme analysis has rarely been performed in most of the reported cases. In the present case the isoenzyme proved to be of liver origin and did not have either the heat stability or electrophoretic characteristics of the Regan isoenzyme which is sometimes encountered as a paraneoplastic phenomenon.

Liver biopsy appearances are invariably non specific comprising varying degrees of steatosis, mild inflammation and local liver cell necrosis. In some cases no histological abnormalities are detected.

Almost all the documented examples to date have been related to renal cell carcinoma, although two cases have been associated with xanthogranulomatous pyelonephritis.[2] Because of this relationship to renal pathology the terms nephrogenic hepatosplenomegaly or nephrogenic hepatic dysfunction syndrome have been introduced. However the occurrence of this phenomenon with adrenal carcinoma, which appears to be the first example of its kind, casts some doubt on the validity of these terms.

The condition both clinical and pathological importance. Clearly from the clinical standpoint there are two aspects which must be considered. Firstly any patient presenting with the above clinical findings and abnormal liver function tests in particular a disproportionate rise in alkaline phosphatase levels without any obvious cause should be investigated for the possibility of underlying malignant disease, notably renal cell carcinoma. Secondly when it is known that a patient has a carcinoma it should not be assumed that hepatomegaly and deranged hepatic function tests indicate metastatic spread to the liver in the absence of unequivocal proof for this. For the pathologist on the other hand the lack of any specific histological

before makes it impossible to provide a definitive diagnosis although an awareness of the condition should encourage it to be considered as part of the differential diagnosis in all cases where the biopsy findings are non specific

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Volvulus neonatorum in the ninth decade

P Barker

Summary

Intestinal obstruction as a result of malrotation of the midgut is uncommon in adults. Less than a dozen similar cases have been documented in the English literature in the last ten years. Clinical characteristics of the condition are mentioned and management briefly discussed.

CASE REPORT

An 85 year old lady was admitted with a two-day history of central abdominal colicky pain vomiting and constipation. Her abdomen was distended and X rays confirmed small bowel obstruction. Four years previously she had been admitted with an identical story and clinical picture. She had settled spontaneously in a week with conservative management and subsequently been allowed home. It transpired that she had suffered similar less severe episodes of abdominal pain and vomiting for at least ten years and had been investigated at the onset by barium meal which was reported as normal. On this admission 24 hours conservative treatment failed to produce any clinical improvement and it was decided to operate.

Laparotomy revealed a volvulus of the caecum and terminal small bowel, which were lying free along with all the proximal colon under the liver. Appendicectomy and colo-caecopexy were performed, no resection being necessary after untwisting the bowel. Unfortunately she died from a massive myocardial infarction 48 hours after surgery.

DISCUSSION

Malrotation of the midgut leading to volvulus and obstruction in neonates is well recognised. It is much less common in adult life. Errors may occur at any of the three stages of rotation of the midgut loop with variation in the clinical picture.

This case illustrates failure of the third stage which involves descent of the caecum into the right iliac fossa and fixation of the post arterial mesentery to the posterior parietal peritoneum. (The mesentery supporting the transverse colon persists as the transverse mesocolon.) The resultant excessive mobility of the malpositioned proximal colon, caecum and terminal small bowel predisposes to volvulus and obstruction.

More often fixation occurs too early before descent of the caecum has taken place and bands may then obstruct the small bowel lying behind the caecum. This condition usually presents in neonates but has been reported in later life.

Volvulus neonatorum is usually described as a twisting of the whole midgut loop about the axis of the superior mesenteric artery resulting from an error in the second stage of rotation. It may follow reduction en masse of the midgut through the umbilical hernia which tends to the abnormal position of the bowel in this situation.

First stage errors are so rare as to be insignificant. Of the reported cases of malrotation causing obstruction in adults all had recurrent abdominal pain and vomiting often associated with constipation. Frequently sudden diarrhoea would presage the end of the attack reflecting the untwisting of the bowel and relief of the obstruction.[1]

The possibility of malrotation is worth considering in adults with recurrent abdominal pain and radiological investigation will usually provide the diagnosis. However the diagnosis has been missed in cases where peptic ulceration was thought to be the cause of symptoms and X rays limited to a barium meal. A follow through is necessary to demonstrate the abnormal anatomy and radiological screening confined distally to the duodenal bulb to exclude ulceration will miss a malrotation.

Once identified the treatment of this condition is surgical. In acute cases resection may be required but when it is not, then some form of fixation of the hypermobile bowel is needed. Simple suture of the unfixed bowel to the parietal peritoneum is

regarded as inadequate by some who recommend burying the caecum in a pouch of posterior parietal peritoneum and suture of the mesenteric and parietal layers together after incision. Caecostomy may also be an effective method of fixation and allow decompression of the obstructed small bowel.

Acknowledgements

I would like to thank Mr J P W Grant, Selly Oak Hospital, Birmingham for permission to report this case

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The origins of the war neuroses

P S Ellis

PART I

Strange friend, I said, here is no cause to mourn. None, said that other save the undone years, The hopeless wrass.
Wilfred Owen, Strange Meeting

MANKIND has waged war for thousands of years and individuals within these conflicts have experienced the many symptoms of apprehension and fear which we now know help to trigger adaptive physiological responses. This essay is concerned with the maladaptations of individuals to warfare: the war neuroses.

Perhaps the earliest example is to be found in the writings of the Greek historian Herodotus (born c 484 BC) the chronicler of the wars between the Greeks and the Persians. A possible case of hysterical blindness occurs during the Battle of Marathon 490 BC.

An Athenian Epizelus son of Cuphagoras fighting in the melee and behaving valiantly was deprived of sight though wounded in no part of his body nor struck from a distance and he continued to be blind from that time for the remainder of his life. I have heard that he used to give the following account of his loss. He thought that a large heavy armed man stood before him whose beard shaded the whole of his shield that this spectre passed by him and killed the man that stood by his side. Such is the account I have been informed Epizelus use to give.

The Roman Epicurean poet Lucretius (c 100–55 BC) describes how dreams of battle may disturb sleep.

Very similar as a rule is the behaviour in sleep of human minds whose massive minutiae are proportioned to massive effect. Kings may take cities by storm are themselves taken captive join in battle and cry aloud as though they felt the assassin's dagger—and all without stirring from the spot. There are many who fight for their lives grinding out to their agony or filling the night with piercing screams as though they were writhing in the jaws of a panther or a ravening lion.

The above passage may have inspired Shakespeare when writing Mercutio's speech on Queen Mab in *Romeo and Juliet*:

"Sometimes she driveth o'er a Soldier's neck
And then dreams he of cutting foreign throats
Of breaches ambuscadoes Spanish blades
Of healths five fathom deep and then anon
Drums in his ear at which he starts and wakes,
And being thus frightened, swears a prayer or two
And sleeps again.

The military historian Fortescue reporting in 1922 to the War Office Committee of Enquiry into Shell Shock discusses the problems encountered in past campaigns.

No doubt there were men who, from one cause or another broke down in every campaign and I have little doubt that this was one of the causes that led to desertion. But such breaks down when they are recorded are not very sympathetically treated and unless a man had proved himself of good courage earlier in action are dismissed as men differing greatly from cowardice. Of course numbers of men went out of their minds in the old campaigns as they still do.

The worst lot of men that we ever sent out to war were the reinforcements that went to Flanders in the autumn of 1794 and to the West Indies in 1795–96. Both behaved infamously as was to be expected from the scum of England gathered together by pressgangs and I have no doubt that there was a great deal of emotional shock among them.

Similarly it is unlikely that mutinous sailors would have been treated with any degree of

sympathy in eighteenth century England. In fact, the colourful novels of Tobias Smollett, who himself served as a surgeon's mate in the Royal Navy, show us the severe privations which even the physically sick had to endure.

When we appeared upon deck the captain bid the doctor who stood bowing at his right hand look at these lazy lubberly sons of bitches who were good for nothing on board, but to eat the King's provision, and encourage idleness in the skulkers. The surgeon grinned approbation and taking the list, began to examine the complaints of each as they could crawl to the place appointed. The first who came under his cognizance was a poor fellow just freed of a fever which had weakened him so much that he could hardly stand. Mr. Mackshane (for that was the doctor's name) having felt his pulse, protested he was as well as any man in the world; and the captain delivered him over to the boatswain's mate with orders that he should receive a round dozen at the gangway immediately for counterfeiting himself sick when he was not. But before this discipline could be executed the man dropt down on the deck, and had well nigh perished under the hands of the executioner.

During the late seventeenth century and for a subsequent period of some 150 years the most common manifestation of war neurosis was nostalgia, also known as Heimweh and maladie de pays, first described by Hofer in 1678 among Swiss troops serving in France.[6] The condition was characterised by melancholy, incessant thinking of home, disturbed sleep or insomnia, weakness, loss of appetite, anxiety, cardiac palpitations, stupor and fever. This disorder was particularly prevalent among the French armies of the First Republic and the Napoleonic Empire and sometimes even occurred in epidemics, notably in the Army of the Rhine (1793–94) in the Army of the Alps (1799–1800) and during the disastrous retreat from Moscow (1812). The eminent French surgeon Larrey observed many such cases during the Russian campaign and described three distinct stages of nostalgia, with an initial period of heightened excitement and imagination, then a period of fever and torpor with prominent gastro-intestinal symptoms, and finally a state of prostration and depression.[7]

One problem which the physicians of these various armies had to face was malingering. Given the meagre diet, low pay, inadequate accommodation and difficult basic equipment with which the average conscript had to cope, it is hardly surprising that some feigned illness in order to gain a medical discharge. Detecting such impostors often proved to be extremely difficult and occupied the minds of military surgeons such as Percy Marshall and Cheyne. It is likely that many cases of functional disease were dismissed as freed in the zealous quest for organic symptoms and signs. However, the simulation of nostalgia was not thought to be widespread in England.

Nostalgia is best seldom feigned, at least in our armies, and probably its simulation would be attended with but little chance of success, when any good results to be obtained by successful imposition. Pinel states that it is a disease common in military hospitals, but he must infer to the French not to our own, for frequency of its simulation in the French armies may be accounted for by the exemption from duty which the disease affording to those who were afflicted by it. It is almost impossible to maintain the alteration and expression of countenance, the languid appearance and sadness so impressed on all the features which are always present in the real disease, the simulator is wanting in the involuntary abandonment, and the apathetic indifference for everything which is foreign to the cherished idea of the true nostalgic, as also in the sudden extravagance of joy which the sight of some object connected with home produces; moreover pretenders generally express a great desire to revisit their native country, whilst those who are really diseased are taciturn, express themselves obscurely on the subject of their malady, dare not to make an open avowal, and are little affected by the consolations which hope or promise affords them.

Another popular nineteenth century theory was to ascribe the unexpected effects of battle and minor trauma to the rush of air created by the passage of large cannon balls. The mind of a ball Maitland briefly mentions this in his account of surgery in the Crimean War of 1854–1856.[8] Unfortunately the case he describes would be better explained in terms of organic neurological disease.

The absence of any ascertainable cause and the alarming symptoms which were present in the following case of nonmission interested me a good deal at the time. In former days it would have been infallibly ascribed to the wind of a ball. Quin, a private in the 18th Royal Irish, suddenly fell down convulsions in the advance on the Redan early in the morning of the 18th June. He never could tell how this happened, not being aware of any injury. He was brought into my ward insensible a few hours afterward. His symptoms were those of severe concussion. The surface of his body was cold, his respiration was slow and regular, and his pupils were contracted. Some days afterward he suddenly became delirious, with injected eyes, one

pupil being contracted and the other a little dilated. He complained much of his head which he afterwards said had felt all the time as if strongly bound by cord. There was never any paralysis or subsequent unconsciousness though for about a month he suffered from severe headache double vision and a pulse unusually slow and little changed on assuming the erect position."

However by 1872 when Legouest published his *Traite de Clinique d Armee* this theory had been completely discarded.

On s est beaucoup occupe jadis et recemment encore des effets produits par le vent du boulet. Il est a peine besoin de repeter que l ardeur placee par le passage d une gros projectile n eprouve aucune espece de modification physique ou chimique. et que son deplacement est incapable de determiner en elle aucun accidents

Turning away from Europe it was the American Civil War of 1861-65 which provided the most significant psychiatric casualties in the latter half of the nineteenth century. This war with battles sometimes taking place among well prepared trench fortifications and under heavy artillery bombardment, was in some ways a precursor of what was to come in the First World War. It was probably the military neurologists who had most contact with soldiers suffering from functional disorders[16].

On the whole general psychiatric problems were given but scant notice in the literature of military medicine in the Civil War. No effort was made within or without the group of asylum heads to mobilize psychiatric talent for the war effort. It was the neurologists rather than the psychiatrists who participated actively in military medicine and profited thereby in experience and knowledge.

One such neurologist was Silas Weir Mitchell who spent a good part of this war at the Turners Lane Hospital, Philadelphia in the company of C. R. Morehouse and W. W. Keen. Although largely a neurological centre this hospital also housed Da Costa's ward for soldiers with irritable heart and over 300 such patients were seen by him. This problem was also considered by a British committee assembled by Earl De Grey which met four times between 1864 and 1868 and eventually recommended the adoption of braces rather than traditional military accoutrements which were thought to oppress the heart."[11] This cardiac syndrome would also later be revealed as functional in origin.

Among Mitchell's patients there were many cases of nostalgia and the American Civil War was the last campaign in which this diagnosis was prominent. The official history of this war records 5,213 cases of nostalgia among the white troops of the North in the first year of the campaign (2.34 per 1000) rising to 3.3 per 1000 in the second year. The problem was discussed by Assistant Surgeon General De Witt Peters in the American Medical Times of February 1864[17]: "It is by lack of discipline confidence and respect that many a young soldier has become discouraged and made to feel the bitter pangs of homesickness which is usually the precursor of more serious ailments. This ailment is a species of melancholy caused by disappointment, and a continuous longing for the home. It is frequently aggravated by a derangement of the stomach and bowels and is daily met with in its worst form in our military hospitals and prisons and is especially bad in young subjects."

In later conflicts such patients would probably have been classified as neurasthenic but at this time Benedikt's classical description of neurasthenia had yet to appear. Neither did the military surgeons have any concept of the psychiatric sequelae of trauma some of them would have undoubtedly heard of sporadic cases of nervous disorder following accidents particularly railway crashes but when this was described by Erichsen in 1864 it was thought to be due to small lesions in the spinal cord giving rise to a state of chronic inflammation—hence terms like railway spine. It was Russell Reynolds who first realised the functional basis of these disorders with Oppenheim and Thompson coining the expression traumatic neuroses and then Walton and Putnam demonstrating the similarity to hysteria. It was not until 1885 that Herbert Page described neurasthenia following trauma.

It was for these reasons that Mitchell elaborated his own theory of the distant reflex effects of gunshot wounds to describe what were in effect cases of post traumatic neurosis.

One of the gravest of the instant consequences of nerve injuries is that which is known as shock. This is commonly described as a condition in which the patient becomes cold faint and trembling, the pulse is small and fluttering, there is a great mental depression and diagnostic incoherence of speech and thought, the surface becomes covered by a cold sweat, there is nausea perhaps vomiting and relaxation of the sphincters. This state of shock, so well known to the surgeon, is simply a reflex effect of the injuries of nerves large or small. In general it affects in varying proportion all the great nerve centres which preside over circulation respiration and voluntary movement. Why in one case the cerebrum should suffer in another the heart and in a third the motor centres of the leg or arm is as yet inscrutable. A ball crushes a nerve and the tremendous shock instantly propagated to

the spine falls ruinously upon some one of the numerous ganglia through which it travels. Is this because it finds a weak point, or is it that conduction checked somewhere causes at that spot destruction from dangerous accumulations of nerve force?"

Mitchell then gives abstracts of 12 cases but observes himself that of these cases only six involve injury to a large nerve trunk. In some examples the soldier appears to develop acute anxiety.

Case 17. Gunshot wound of right wrist joint, injuring the ulnar and median nerves, and causing cerebral excitement. The patient, a colonel, ran along the line of his regiment, half crazed, in a state of wild excitement, and presently fell insensible —not from loss of blood.

Case 18. An officer wounded in the heel was thrown instantly into a condition of the utmost trepidation, and behaved like an insane person. His character for courage was undoubted and a court of inquiry, for which he asked, cleared him on the surgical evidence.

Other cases demonstrate what is probably hysteria.

Case 23. J. D. flesh wound of right thigh without injury of large nerves: complete paralysis of all four limbs: left arm recovered quickly, the other limbs slowly; final development of myelitis.

Case 24. W. W. wound of right thigh with probable injury of sciatic nerve: partial palsy of right leg; reflex paralysis of right arm which recovered rapidly.

In two remaining cases wounds of one leg seemed to the patient to be truly in the other and in one there was a space of anaesthetic skin on the uninjured side symmetrically related to the wound.

It is interesting to note that Venant Legouest's research was following similar lines: he had described cases of soldiers with "les spasmes traumatiques" and "la stupeur générale" following gunshot wounds to unrelated parts of the body. Like Mitchell he thought that the shock might be dissipated throughout the nervous system.

La commotion se manifeste dans les membres et dans les viscères, sa gravité est d'autant plus grande qu'elle atteint des organes à texture plus molle, plus délicate et plus vasculaire. Aussi a-t-elle paru constituer un accident particulier aux centres nerveux dont la sensibilité exquise se révèle par des phénomènes plus saillants que ne le font les autres organes à l'ébranlement dont ils sont atteints.

Mitchell's experiences in the American Civil War were also important in that they sowed the seeds for his later interest in the treatment of neurasthenia. The nervous problems attending upon prolonged p[illegible] had been studied since the early part of the nineteenth century. James in 1831 discussed the West end Tea Syndrome followed by Hunt's work on nervous exhaustion and Barker on nervous asthenia. Van Deusen published his work on neurasthenia in 1869 only two months before Beard's preliminary study of the problem. Van Deusen emphasised neurasthenia as being more a problem of chronic debility. George Beard's magnum opus was published in 1880 under the title *A Practical Treatise on Nervous Exhaustion (Neurasthenia) its Symptoms Nature Sequences Treatment*. Although rooted in Brunonian Theory with sthenic and asthenic types having increased and decreased excitability respectively, Beard also assimilated the work of Meyer, Funk and Helmholtz on electricity and the conservation of energy and in a more general way Darwin's theory of evolution with the brain having an ascending hierarchy of parts and functions. With hysteria, neurasthenia became the other major diagnosis within the neuroses. It encompassed many features of the anxiety and depressive conditions and was adopted by Victorian society as a fashionable illness. Glynn discussed the malady in 1910.[14]

Neurasthenia whether it occurs alone or in association with hysteria, betrays itself by its characteristic cranial discomfort: sensations of pressure or emptiness or other abnormal feelings, heavy pain in the occiput or various parts of the cranium aggravated by physical or mental effort, pain in the back, especially over the lower vertebrae and sacrum, often a feeling of stiffness which retards free movements and insomnia. There may be difficulty in falling asleep or sleep may more or less readily set in but pass off in an hour or two leaving the individual a prey to insufferable restlessness or fidgetiness aggravated by tinglings in the limbs. There may also be any or all of the following: vertigo, tinnitus and muscae volitantes, asthenopia, sexual weakness, circulatory disturbance, increased frequency or irregularity of the pulse, palpitations, spurious angina, vasomotor irritability, atonic dyspepsia often associated with flatulence and constipation. The mental troubles are many and marked: on the emotional side there are sadness, weariness and pessimism, repugnance to effort, abnormal irritability, defective control of temper, tendency to weep on slight provocation, timidity. On the intellectual side lessened power of attention, defective memory and will power. ... The objective symptoms of these are few and obscure. In a marked case the subject looks dejected and stupid, he stoops and his gait and movements are sluggish, his speech is slow

[illegible] rare [illegible] equal . . . The pulse may be quick and often it is too readily accelerated. There is in some instances slight unsteadiness on standing with closed eyes. In others there is an abnormal tendency to flushing and sweating."

As mentioned earlier, it was Silas Weir Mitchell who developed what was to become the most popular treatment of neurasthenia, his rest cure. This was based upon complete rest, a largely milk diet and isolation from relatives. With Erb's electro-therapy, this treatment dominated the sanatoria of North America and Europe until well into the twentieth century.

Literature directly discussing or alluding to the other major wars of the nineteenth century and their psychiatric consequences is scarce. Glynn quoting Guion from his *Agents Provocateurs de l'Hysterie* briefly mentions some cases of soldiers wounded in the Franco–Prussian War of 1870–71 in whom hysterical paralyses developed at periods varying from 2½ to 15 years after these injuries. No reports are available for the Russo–Turkish War of 1877–78, while the *Official Surgical and Medical History* of the war between Japan and China (1894–95) offers only some advice on the evacuation of the insane and mentally ill with hints to avoid accidents to the patients or attendants, and brief details of 14 cases.[14] These included five men with melancholia, six with mania, and three with dementia, general paralysis of the insane and hypochondriasis respectively.

Considered from the date of their occurrence, they had no direct relation with the battles of the Yellow Sea and Wei Hai Wei, most of them happening after the occupation of Wei Hai Wei in the year 1895. In 1893 (time of peace) ten persons were affected with mental disease, and the above mentioned fourteen cases showed no sensible increase on ordinary years. So we may say that our Navy had no special large number of mental affection on the account of the War.

However, the Boer War of 1899–1902 did produce significant numbers of psychiatric casualties, as did the Spanish–American War which was in progress at the same time. Salmon refers to this obliquely.[15]

There is a strong suspicion that the high insanity rate in the Spanish–American War and the Boer War, and perhaps in earlier conflicts, was due in part at least to failure to recognise the real nature of the severe neuroses which are grouped under the term shell shock in this war (World War I). This may account for the remarkable recovery rate among insane soldiers in other wars.

The Boer War was largely due to the British colonial expansion northwards from the Cape in South Africa, which had originally been annexed in 1814.[16] This expansion not only drove a wedge between German South West Africa and German East Africa, but also steadily drove the descendants of the original Dutch settlers northwards, leading to the establishment of the small Afrikaner republics of the Orange Free State and the Transvaal. Kruger, President of the Transvaal, refused to give full citizenship to the large numbers of fortune hunters arriving in the Republic after the discovery of gold and diamonds in the 1870s, and it was the treatment of these 'outlanders' which became the formal cause for war with Britain.

The war was fought by the Boers as a guerilla campaign and the number of traditional battles was small. The British admissions for mental disease totalled 781, of whom 17 died and 620 were invalided home. This amounted to 1·4 per 1000 annually.[1] However, there were probably many other psychiatric casualties who went unrecorded and recovered after rest.

"It is, I believe, a fact that even the bravest man cannot endure to be under fire more than a certain number of days, even if the fire be not very heavy. Lord Byng, I am pretty sure, found this out in South Africa after 80 or 90 days. My brother, Brigadier General Charles Fortescue, had in his column in South Africa a Canadian officer who was a proverb for daring, but even this officer broke down for a time after every enterprise of any continuance and needed a fortnight's rest from fire to restore him. To this fact I attribute the occasional notices of the mysterious disappearance of tried old soldiers in former wars."

Some cases of neurasthenia are discussed by Morris in his essay on war sequelae.

"A most remarkable evidence of the privation, exhaustion and mental strain that many had to pass through was seen in the cases of neurasthenia that occurred. It was really terrible to see the condition of fine strapping men, prostrated in this way, which led them to shrink from the slightest touch and to shed tears like children. . . . A patient took part in the memorable siege of Paardeberg. He got sunstroke, was unconscious for one and a half hours, but then returned to the fight and seemed to have wandered away from everyone, having lost his way. He was found and brought back to hospital, but was unconscious for five days. He had at the hospital ptosis of the right eye for four or five days, followed a day or two later by numbness gradually spreading upwards from the right leg to the thigh, accompanied by cramps and later gradual loss of power which affected the whole of the right leg. When I saw him

the right leg by any of its joints and if the knee flexed by force it caused great pain There were loss of sensation to touch and pain below the knee and slightly above it Dr Fetriet saw him and considered it to be a case of functional paralysis but treatment had no effect he seemed to glory in having the battery applied so strong that it doubled him up and he left for his home unimproved and I have been told that he suffered very much both mentally and bodily I could give many instances of neuroses produced by nerve shock but I think these will suffice and I am anxious to turn to the surgical side

However it will be observed that the case given was more akin to hysteria than neurasthenia Other medical officers describe cases of more classical neurasthenia

Case XI—An officer of the RMA age 38 had all through the war held a responsible position in the Intelligence Department. About the middle of April during a march he became rather suddenly very emotional, bursting into tears in an uncontrollable fashion at the same time he suffered from giddiness, but without headache This passed off in a day or two and he resumed duty A month later he had another attack like the last in degree and duration In June his General sent him back from the front, but he continued on duty At this time he was very emotional again could not apply himself to work writing a letter was a great trouble to him he found himself making mistakes in writing, dropping words here and there and his writing altered in character became scrawling and not so good as formerly At this time also he was very irritable sleeping badly sensitive to noises and strong light, in fact typically neurasthenic. In October after his return he was decidedly improving last, but he could still not go among people because of the tendency to burst into tears He was then slightly unsteady in walking toe and heel down a line, and with the eyes shut he suddenly fell down The knee jerks were not increased but decidedly neurasthenic in character In December he had so much improved that he returned to light duty

The same author goes on to describe a classical post traumatic hysterical paralysis

An officer was wounded in the sacrum whilst scrambling up a kopje under fire and though not apparently seriously hurt at the time, he had pain in the back next day and in the course of three weeks became gradually paraplegic. We saw him five weeks after the injury in one of the base hospitals He then had almost complete paralysis of the lower extremities but the bladder and rectum were quite unaffected and sensation was also quite normal There was no pain and the limbs exhibited no rigidity or increase of reflexes The patient was much depressed and believed himself to be permanently paralysed We assured him he would get quite well and suggested massage and galvanism with the result that improvement was so rapid that in a fortnight he could walk about the ward and was improving daily

Another patient seems to demonstrate hysterical hypæsthesia

A pistol was shot through the thigh and had symptoms of contusion of the sciatic nerve He had but little evident muscular wasting, and no complete anæsthesia but complained of constant pain and was consequently kept more or less under the influence of morphine On account of the intolerable nature of the pain the surgeon under whose charge he was sent down on the sciatic nerve at the seat of the wound and divided some scar tissue that seemed to compress it, but the operation gave no relief We saw the man in one of the base hospitals and advised stopping the morphia, and the use of gentle massage and passive movements with the result that the patient became almost intractable from his pain and morphia was again resorted to After a time it was once more stopped with the same result and finally the man had a violent hysterical fit, after recovery from which there was complete and permanent cessation of all pain.

The hysterical fit which terminated the clinical course of this patient is an example of hysterical dissociation, as opposed to the functional paralyses which demonstrate hysterical conversion Hysterical dissociation in traumatic situations is demonstrated in the last of the series of case histories

A patient near to whom a shell had exploded without causing evident injury became quite deaf and dumb forthwith He remained for weeks in this condition, but we were told that when on board ship on the way to England he woke up one morning to find he had completely recovered both speech and hearing.

This latter case history is almost typical of what would become known as commotional shell shock in the First World War with a near miss shock producing such symptoms with no external signs of injury

The next significant war which occurred was that between Japan and Russia in 1904–05 Like the Boer War this was also primarily a colonial war It began with the Japanese attack on the Russian naval base of Port Arthur and ended in Russian defeat, with Japan gaining virtual possession of Korea, annexing the southern half of the island of Sakhalin and taking over the Russian lease of the Liaotung peninsula which gave them entry to Manchuria.

This was notable for a number of reasons firstly in that the number of psychiatric casualties was much larger than expected, secondly that it saw the establishment of the first forward psychiatric clearing hospital equipped with its own specialists and finally in its recognition of war neuroses arising without a history of trauma. Because the numbers of psychiatric cases exceeded the expectations of the Russian army medical department, the Red Cross Society of Russia was asked to assist, and it was through this body that a number of French and German doctors were able to work at the front and record their experiences. As early as 1905 Hollander reported a case of post traumatic hysteria [24]

A Lieutenant in the Russian Navy took part in the defence of Port Arthur. After an attack on his vessel, two Japanese sailors tried to strangle him. He threw himself into the sea became unconscious and only awoke three weeks after in a Japanese hospital. When Doctor Hollander saw him he had marked spasm of the respiratory muscles, fainting fits and hystero-epileptic convulsions. As dyspnoea increased Doctor Hollander performed a tracheotomy which restored the respiration to normal and when the cannula was removed twelve days later the dyspnoea had gone. The spasms recurred afterwards but were mild and took place at long intervals.

In 1907 Honigman discussed the neuroses of military men after a campaign at the German Congress of Internal Medicine. He was the first to coin the term 'Kriegsneurosen' — war neuroses and noted that the symptoms were like those observed in traumatic neurosis or the railway brain of civilians. He thought that they were partly of a hysterical and neurasthenic nature and partly hypochondriacal. He had seen various cases of hysterical monoplegia, hyperaesthesia, hypoanesthesia and hemianaesthesia. In general he thought they had a better prognosis than cases of traumatic neurosis seen after accidents in factories and workshops.

It seems surprising that the large numbers of psychiatric casualties pass without mention in the substantial British War Office report on medical and sanitary aspects of the war despite the fact that British observers were present in both armies. In fact the most comprehensive review is by the American medical officer Richards. Japanese reports are not readily available but on the Russian side the number of patients with nervous disorders was approximately 1 500 in 1904 and 2 000 in 1905 [6]. A small psychiatric clearing hospital with 50 beds was established at Harbin in 1904. Under Professor Awtokratow this took over from a small building which had been attached to the military hospital No. 1 in the same town. Two other small psychiatric centres were established in private houses and each had an experienced psychiatrist in charge. There was also a mobile psychiatric field ambulance at the front, with a psychiatrist, three men and an 'aufsehor' or supervisor.

The majority of the patients were evacuated to Russia as quickly as possible so as not to swamp the facilities in Harbin but even so there was always an overflow into the general military hospitals. The average stay in Harbin was 15 to 16 days, with around 82 patients being evacuated to Moscow each month. Special cars were made available for these evacuees, which were then hitched on to the regular hospital train. The enlisted patients made this long journey of 5 300 miles taking 30 days in three cars with barred windows — 'Arrestanten Wagen'. The sick officers the surgeon and the nursing sisters travelled in a second class car while the attendants and soldiers had two 'Warmewagen' — cars with stoves. Later eight cars with heavy glass windows 'Schiff's Glasfenstern' replaced the 'Arrestanten Wagen'. In addition there were three staging hospitals en route at Tschita, Krasnojarsk and Omsk each with a psychiatrist in charge, although the team at Omsk formed part of the military hospital there. Patients who relapsed during the long journey home were left at these staging hospitals until fit to travel again. During the 15 months of its existence the central psychiatric hospital at Harbin made 37 such evacuations of its patients by rail usually between two and four times each month. One transfer was also made by sea at the end of the war, but the psychiatric patients fared poorly on this 70 day cruise, with nearly 56% succumbing to seasickness compared with only 22% of the ship's crew.

The total of approximately 3 500 cases of psychiatric illness is only a rough estimate, and many were lost to follow up. For instance at Harbin a large number of cases of hysteria occurred, particularly among the enlisted men.

The 305 cases of epilepsy seem surprising, but in the case of war with prolonged operations it appears that previously healthy persons suffer epileptic convulsions. The horrors of war and the exhaustion following prolonged exertion brought to light epileptic conditions in people not previously suspected of such a condition. The Russian soldiers feared greatly the Japanese grenades which on bursting developed quantities of brownish blue poisonous gases. It is said that men in the immediate vicinity of these were prostrated by the gases and often remained unconscious for several hours. On awakening

these men were deaf and dumb and alte[illegible] gradually regained their speech and hearing. One has the impression, though that many of the cases had a large hysterical element

However the review of the cases examined in Moscow records only 16 cases of epilepsy. Of the men seen in Moscow 8% of the officers and 14% of the enlisted men had non traumatic neurasthenia. It is much more difficult to analyse the figures for non traumatic hysteria and for post traumatic neuroses of both classes. Apart from the cases lost to follow up many surgical cases had a neurotic overlay for instance hysterical disturbances of sensation contractures and tremors following shrapnel and gunshot wounds to the body and among the deaf and dumb cerebral concussion cases. In discussing the psychiatric casualties Richards observes

A future war will call at least equally large numbers of men into action. The tremendous endurance bodily and mental required for the days of fighting over increasingly large areas and the mysterious and widely destructive effects of modern artillery will test men as they have never been tested before. We can surely permit then on a larger percentage of mental diseases inquiring our attention in a future war

Before discussing the psychiatric casualties of the First World War it is worthwhile examining the concept of hysteria as understood at this time which neurasthenia formed the other main diagnostic category within the neuroses. The salient features of neurasthenia have already been noted. Until the mid nineteenth century hysteria was thought to be due to a disorder of the uterus with the word being derived from the Greek hustera or womb. Savill quotes Sydenham, writing in 1670

Of all common diseases hysteria unless I mistake is the commonest. As to females if we except those who lead a hard and hardy life there is rarely one who is free from them

Beddoes describes the characteristic features in a later eighteenth century work

This disease attacks in

1 Paroxysms or fits
2 These commonly begin by some pain and fullness felt in the left side of the belly
3 From this a ball seems to move with a grumbling noise into the other parts of the belly and, making as it were various convolutions there seems to move into the stomach and more distinctly still rises up to the top of the gullet where it remains for some time and by its pressure upon the larynx gives a sensation of suffocation
4 [illegible] proceeded thus till the patient [illegible] with a stupor and insensibility, while at the same time the body is agitated with various convulsions
5 The trunk of the body is writhed to and fro and the limbs are variously agitated commonly the convulsive motion of one arm and hand is that of beating, with the closed fist, upon the breast very violently and repeatedly
6 This state continues for some time and has during that time some remissions and renewals of the convulsive motions but these at length cease leaving the patient in a stupid and seemingly sleeping state
7 More or less suddenly and frequently with repeated sighing and sobbing, together with a murmuring noise in the belly the patient returns to the exercise of sense and motion, but generally without any recollection of the several circumstances that had taken place during the fit.

This disease occurs especially from the age of puberty to that of thirty five years. At all ages, the time at which it most readily occurs is that of the menstrual period. physicians have at all times judged rightly in considering this disease as from an affection of the uterus and ovaria.

In the latter half of the nineteenth century the problem of hysteria was dominated by the work of Charcot and the Paris School of the Salpetriere Hospital in France. Charcot described the hystero-epileptic fit with four stages epilepsy, meaningless contortions dramatic display and delirium. However when Charcot died the days of La Grande Hysterie seem to have died with him and many observers now believe that these cases were done to please patients performing as they thought was expected of them.

The main features of classical hysteria were outlined by Gregerod in the Lumleian Lectures for 1914. These included hysterical fits, retraction of fields of vision, anaesthesia, contractures of muscles and occasionally oedema and ecchymoses. It was the presence of what could be considered as organic features that led other investigators to look for a neuropathological basis for hysteria. Bramwell thought that it was a disorder of that part of the nervous system which subserves the emotions. Bastian saw the motor and sensory paralyses as being due to local inhibitions of the central nervous system possibly local vasospasm. Sir William Gowers thus tried to explain all aspects of hysteria as an instability or sudden irritability of all the nervous and reflex centres throughout the body.

There was an equal proliferation of psychological theories to explain hysteria. Bernheim and

Babinski found the key point in suggestion although Bernheim was more closely linked with Dubois and Grasset in thinking that hysteria was a form of insanity. Babinski like Marie and Freud had been a student under Charcot. He thought that hysteria was simulation of disease as the result of auto-suggestion or subconscious simulation and proposed a new term pithiatism to describe a group of such disorders which could be cured by auto- or hetero-suggestion.

The two other main psychological schools were those of Janet and Freud. Janet thought that hysteria was

> "A form of depression characterised by the retraction of the field of personal consciousness and a tendency to the dissociation and emancipation of the systems of ideas and functions that constitute personality."

The work of Freud and Breuer had begun to appear in the 1890s. In 1895 they published their *Studies in Hysteria* in which they formulated the idea that hysterical patients suffered from the repressed memory of upsetting traumatic events that were so distressing that the emotions they aroused could not be faced at the time they occurred. The secret of curing the hysterical symptoms was to give these pent up emotions free expression by means of recollection under hypnosis, the technique of abreaction. Freud however saw the limitations of this method not everyone was susceptible to hypnosis and the results were often transient with a symptom disappearing only to be replaced by another. Thus Freud developed his theory of free association in which the conscious ego could work through the underlying conflicts. He found that many of his patients talked spontaneously about their dreams during these sessions revealing a symbolic latent content rooted in infantile sexuality. This work appeared in *The Interpretation of Dreams* (1900) and *Three Essays on the Theory of Sexuality* (1905). However the idea that unconscious conflicts could produce defence mechanisms such as hysterical conversion had by no means gained wide acceptance in 1914 and many people found Freud's theories quite distasteful.

Few scientific theories escape the fate of being pushed by their advocates beyond the positions which they are fated to hold, with the result that, failing to fulfil the expectations thus aroused, their merits are underestimated or even thrust into the limbo reserved for dead hypotheses only to be resuscitated therefrom by some later generation. If we are to trust the contemporary medical literature of this country this fate is not in store for Freud's theory of the unconscious. His views or perhaps their applications have stirred up such a hotbed of prejudice and misunderstanding that their undoubted merits are in serious danger of being obscured or even wholly lost to view in the conflict produced by the extravagance of Freud's adherents and the rancour of their opponents.

However the particular theory of either hysteria or neurasthenia to which any one practitioner adhered is something of an aside. The main point to make is that as the First World War loomed ahead in 1914, most neurologists and psychiatrists were aware of the different manifestations of the neuroses, and intimately with regard to likely events in battle they were aware of the post traumatic neuroses. Glynn's review of 1910 has already been mentioned.[4] In the concluding section of his review he analysed the patients he had seen during the previous five years.

> I find that the cases of traumatic neuroses are 40 in number. 23 of these are cases of hystero-neurasthenia, 13 of neurasthenia and 4 of hysteria. 22 of the 23 traumatic hystero-neurasthenia cases were labouring mainly. Six of the 13 neurasthenia cases were persons of a better class injured in railway accidents. Of the 4 hysterical cases 1 was a boy, another a girl and the two others young men. As to prognosis cases of traumatic neurasthenia and mild hystero-neurasthenia as is generally recognised, manifest a disposition to recover when they obtain compensation or damages but the more severe hystero-neurasthenic cases do not exhibit the same tendency.

It should also be noted that at least some of these practitioners should have been familiar with some of the literature discussing psychiatric casualties in battle particularly that arising from the Russo-Japanese war.

To be continued

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Don't forget the donor

A O Connor

LOOKING for a new job in a fairly advanced age is a problem which inevitably confronts many medical officers who have made a permanent career in the Royal Navy. To attempt to do this in a totally new speciality might be considered unwise—to try in addition to start again in a new country altogether could be called foolhardy. This appeal fortunately did not strike me when on approaching retirement, I applied for the position of Deputy Director of the Red Cross Blood Transfusion Service in Western Australia. The result has been nearly ten years spent in an extremely happy appointment in a glorious part of the world together with a realisation of what a lot of mistakes I made when issuing blood rather than collecting it.

The Blood Transfusion Service in Australia is run entirely by the Red Cross (with considerable Commonwealth and State Government financial aid) and the appointment called for administrative and clinical experience not necessarily in haematology. The Ministry of Defence and the Haslar Hospital had provided some of this background and my contacts with Red Cross during the making of the naval film *Don't Let Him Die* helped me to get the position. The Royal Navy generously agreed that they would consider my first month in the new appointment as "vocational training" but unfortunately they felt they could not agree to my travelling expenses claim—10 300 miles.

From the gangway of the Institute of Naval Medicine to Perth Airport in Western Australia is just over 24 hours by the sun—a little but more by the clock. This just enabled me to start work in Australia the morning after leaving Alverstoke and in retrospect I can only hope that my total ignorance of the work of a Blood Transfusion Service was covered for a short time by sympathetic references to "jet lag". When this excuse had worn thin, my errors were generously put down to unfamiliarity with the country, but the [illegible] really true because I had visited Perth before and found it not only a most beautiful city but to have a pertinent climate whilst Western Australians are charming people. It is said that some strikes always ask "Where were you at school?" or "Who was your father?" or "How much do you earn?" The question to a newcomer in W A is always "What'll you have?"

The other thing they say about W A is that, "The birds don't sing, the flowers don't smell and the fish stink". These things don't matter when seen alongside the lovely city rising from the banks of the wide, River Swan, the beauty of the wild flowers, the wonderful beaches and the total friendliness shown by everyone. We had been advised never to talk politics or criticize the customs—we never wanted to do the latter but the unexpected dismissal of a Government by the Governor provided a wonderful opportunity to learn about the political emotions of our hosts.

The first surprise on arrival was the size of the Blood Transfusion Service in W A. It costs about £2 000 000 a year to run and although based in Perth it regularly provides blood for hospitals further away than Moscow is from Haslar. The State alone is larger than the whole of India and when visiting the furthest Blood Banks in the north (a four day drive) the adjacent State border is 2½ hours in advance of local time. Perth itself is the most isolated city in the world being about 1 500 miles from the nearest big city Adelaide. The population is little over one million whilst the rest (about a quarter of a million) live in small isolated towns all over the State. About 12 of these towns have small Blood Banks to supply their local hospitals many of which are very well equipped to undertake major surgery—they have to be because of the enormous distances involved. However most

surgery is obviously restricted to the metropolitan area of Perth which has four excellent teaching hospitals and a flourishing medical school.

The second surprise was the enthusiasm and determination of donors to give their blood. I am ashamed to say that I had personally never donated blood before arriving in Australia and on looking back, I don't think that many of my contemporaries were regular blood donors. However in this one metropolitan area we were collecting about a thousand units of blood a week and an even higher proportion in the country. Blood Banks where the local inhabitants would often get really hurt and annoyed if they were not able to donate regularly to their own Blood Bank. The only time any Australians have ever spoken rudely to me (apart from a few doctors who couldn't get what I didn't have) was when they were told that they couldn't donate for any reason but by far the more usual reaction was one of very genuine and real disappointment. In spite of this surprisingly few members of the medical profession are regular donors and those few are mainly general practitioners—surgeon-donors seem to be very rare. Otherwise the cross section of donors is extremely varied from highly paid executives to hopeful donors who are obviously longing for a free meal or from staid professional societies to organised groups of "bikies".

The main task of the Deputy Director was to look after donors and staff in the clinic where the blood was collected and also to be responsible for the organisation of the mobile collecting team and country Blood Banks. For someone whose basic knowledge of blood was that it came in eight different groups, must always be immediately available, fresh and in unlimited quantities this seemed an easy responsibility. I had not allowed for the problems of getting as many components as possible out of every donation within a strict budget, without involving overtime and arranging that the laboratories never got too much or too little to cope with. The frequent decisions on how best to collect blood from someone recovering from a miscarriage who had had a cold for which they had taken aspirin whilst on holiday in Bali where they had also taken antimalarial precautions needed the judgement of a Solomon or a capable nursing sister.

All blood used in Australia is obtained from volunteer donors and the same applies to components. No imported material is allowed which means that all haemophiliacs are treated with Factor VIII and other clotting components which are prepared within Australia. It is this need to provide Factor VIII either as Cryoprecipitate prepared locally from the fresh frozen plasma or Anti-haemophilic Factor (AHF) that really controls the whole Transfusion Service. AHF is produced by the Commonwealth Serum Laboratories in Melbourne from frozen plasma provided by each State and in this form it is returned to the State in proportion to the quantity of plasma originally provided—which is not necessarily the same as the proportion of haemophiliacs in the population. As Melbourne is 2500 miles away from Perth all the W. A. plasma has to be flown across Australia packed in dry ice, a procedure which adds enormously to the cost. To make matters worse haemophiliacs seem to be blessed with abundant energy and unsuitable demands for treatment as a result. Each State hopes to be able to achieve about two units of Factor VIII per head of population and this enables most of their problems to be dealt with adequately. However the haemophiliac who was ecstatically getting his throat, or taking an overdose of aspirin with the inevitable haemarthrosis that resulted used to stretch our patience to the limit. The cynical comment: "The cost of Factor VIII should be vasectomy" did not always sound unreasonable.

Whilst the amount of red cells collected is determined largely by the haemophiliac population as a result of the need for plasma their subsequent use is mainly in the form of packed cells and is controlled by the large number of hospitals which have to hold stocks that are adequate to meet any emergency until such time as additional supplies can be sent by road or air. There are 18 hospitals with blood banks in the metropolitan area and a further 12 in outlying towns. As the typical emergency in the depths of the country nearly always seems to involve a young heavy negative female, the amount of blood which has to be held in stock in these banks presents a really serious problem if wastage is to be kept to a minimum. Fortunately country dwellers are extremely generous in their donations but inevitably excesses arise in outlying areas where blood (always from experienced donors) has to be given quickly before the stringent tests which are normally applied are possible. No complication has ever arisen as a result.

The other major problem is the provision of platelets which fortunately I didn't have invented when the writer was an anaesthetist. The rate of use of platelets varies widely as does their usefulness and this taken into consideration with a shelf life of about three days makes provision on demand extremely difficult. The new plastic bags which provide a possible extension of the present shelf life up to five days or even longer will hopefully reduce many problems in this area particularly at long weekends when both staff and donors are in short supply. One

sometimes suspects that platelets are being used in place of a ligature and that they tend to fall up on the operating theatre floor.

In addition to normal blood collections and separations Perth provides a cell separator service which produces suitably HLA matched single donor platelets and leucocytes. These preparations involve the use of both arms and make a considerable demand on the donor who is usually a prisoner of the cell separator machine for about three hours in the case of leucocyte collections. Nevertheless it can have a panel of up to 1500 donors who have volunteered to give in this way and many actually prefer these donations as they feel they have a particularly close relationship with the anonymous patient. The difficulty from our point of view is the expense of the apparatus and the time of the staff involved—not to mention the occasional problem which arises after the donor has been fortified for his long ordeal by a liquid lunch. (This is not being sexist—male donors usually have better veins for cell separation.)

There is a flourishing plasmapheteesis clinic which collects not only immunoglobulins but also an increasing quantity of normal plasma for Factor VIII supplies. Donors enjoy giving plasma by this method because they can do so monthly and thus rapidly build up a donation record of which they can be rightly proud. Many of these donors are women approaching the upper age limit (65) who have been donating anti D immunoglobulin for about 30 years as a result of earlier rhesus immunisation following an unprotected pregnancy. The Western Australian Blood Transfusion Service under the directorship of Dr Martin Davies was in the forefront of studies of rhesus immunisation and the protection of rhesus negative mothers and for many years this State (with New South Wales) supplied anti D from naturally and artificially immunised donors for the whole of Australia. Many of these women (and some men) have given over 150 of such donations which is a remarkable tribute to the generosity of those wishing to help other mothers avoid the tragedy of a rhesus affected baby.

This rhesus immunisation programme provided the most extraordinary coincidence for me shortly after my appointment. One of the most frequent anti D donors a young man with only one arm was undergoing plasmapheteesis and I made some cheerful comment about giving twice as much if he had only had two arms. He took it in good part but realising that I was obviously a Pom he told me that he'd left the other arm in UK and added that the Royal Navy had got it in a large naval hospital as a result of an accident when he was on loan to a submarine establishment. With a sinking heart I asked him the time and place only to have it confirmed that it was a motor bike accident at lunchtime on Christmas Day at the corner of the Hashi Hospital—some may still remember the incident as well as I do. He added that it was a chap called Phil Felford to whom he owed his life that afternoon—but he obviously didn't know who had also been involved with the emergency and had possibly given him the unit of positive blood which produced the anti D that has now helped about 1500 Australian mothers.

It was particularly appropriate that some years later we had the honour of showing His Excellency the Governor Rear Admiral Sir Richard Trowbridge and Lady Trowbridge the President of the W A Division of Red Cross round the Blood Bank and I was able to present this ex naval rating from HMS *Dolphin* who had done so much to help Australia.

After I had been in the appointment about six years the Director left to take up an overseas position and I was appointed Director as a sort of stop-gap whilst an experienced haematologist could be found. This took much longer than was expected but at last a relief was found and retirement is in sight.

On looking back once I learned never to refer to donors as patients. I found them and the staff a wonderful group to work with. Dealing with people whose only wish is to give and to do that anonymously to the maximum extent that is possible is a stimulating environment in which to work. Although there may not be much clinical medicine around the donor/donation relationship is a very special one. It calls occasionally for a great deal of tact, patience and understanding—qualities which I realised with some shame had not always been to the forefront in my dealings with the more difficult type of patient. When a donor comes hours late or when the clinic is just closing, or is rude or domineering, or self important it can be difficult to remain welcoming and good tempered and to press the donor to have yet another cup of coffee but their generosity deserves and always gets this considerate attention from all members of the staff.

I would like to feel that the users of blood and components show an equal appreciation of the generosity of those who alone can provide the life-giving material which sometimes seems to be dispensed rather liberally and casually. It can be difficult in the tension and drama of an operating theatre to remember how much is owed to those who gave so generously without any thought of reward and in a way it is a pity that blood has no recognised monetary value (possibly £50 a unit) to bring its importance home to hospital accountants

as well as the doctors However the next time it anybody says Let s crossmatch half a dozen to be on the safe side I hope that this short description of the work of a Blood Transfusion Service might help them to remember the generous donors and to make a special point of returning the excess to the laboratory while it can still help other people Single unit transfusions or topping up the patient" as a sort of tonic are extravagant and unsuitable uses of blood Any form of wastage of blood due to casual handling is totally unjustifiable in the light of the effort which goes to produce it and the same applies to all blood components Don t let us ever forget the anonymous donor without whom all recent advances in surgical procedures would have been impossible

J [illegible] S [illegible] 1984 70 182–185

Memories of Malta 1940–42

B B Waterman

THE P & O *Strathmore* moved slowly up the Grand Harbour on a perfect morning in early May and as we passed Bighi I borrowed a pair of binoculars from the little Air Marshal standing at the rails to have a closer look at the hospital buildings. He asked with solicitude whether my husband was a patient, to which I replied with amusement, "No I'm a Naval Sister taking up my appointment there."

Soon the ship had anchored and very surprised I was told to go to a lower deck and that the Bighi boat was alongside to fetch me. Following my gear I scrambled down into the boat to be greeted by a medical officer and sister while my friends of the voyage waved goodbye from the deck above.

This was before the fall of France and Italy was not yet at war and for the next month life seemed to be a social round of picnics, swimming parties, tennis, dancing, drinks parties and concerts and not too much work! The strange thing is that, on re-reading my diaries of the next two years, our lives were still full of these social occasions, it seemed as if these activities were a continuing gesture of defiance against the enemy, spoil sports.

At 7 am on 11 June 1940 we were awakened by bombs dropping on Kalkara village just outside the hospital gates and in the dockyard—we were now at war with Italy too and the siege had begun. Our patients, with most of the staff, were evacuated to the 90th General Hospital at Imtarfa, about eight miles away. The Matron and four of us sisters, the senior medical officers and the more senior sick berth attendants remained to cope with emergencies. We filled our days as best we could, and volunteered for duty when the laundry maids ran away. I soon blotted my copy book by winding a heavy flat iron on our rather dandified SRA's long white trousers, forgetting that the creases should have run fore and aft, and turning them into bell bottoms.

The Bighi postman was stationed on the roof and would warn us when he thought the bombers were coming our way. There was then a general stampede from various buildings and we would run as fast as we could to our shelter (or kenn in Maltese). This was under the Administration Block and the church. It had a blast proof door and windows with heavy iron shutters and we felt safe there. Members of the Medical Mess and the sisters slept in adjoining rooms which were part of a storage complex. We also rigged up a little chapel in another room and the Padre gave us communion each morning after we had all exchanged pleasantries over an early morning cup of tea supplied by the sisters.

Our dormitory was a truly fascinating place. The shelves were filled with marvellous copper cooking utensils from Nelson's time and many other antiques, objects from ships of the line probably from the time of the Battle of the Nile. I wonder where they are now? To add to the interest three warm five smart naffins (Officers) stanked in a normal and we were five in number! Each of us took our to serve as a slightly macabre dressing table then put up our mosquito nets and settled in comfortably.

One particularly noisy night set all the copper jingling, followed by a very loud rattle and bang, and we wondered what had hit us. The light was switched on and there we were all sitting up in bed with our tin hats on and poor M with four or five heavy cauldron lids tied together about as much from her nose caught up in her mosquito net.

One night in July an SBA was killed by blast from a bomb which wrecked the theatre—he was a few yards ahead of the duty officer on his rounds, who was luckily only slightly hurt. Soon after this—I went up to Imtarfa and how glad I was to have some real work to do at last. The Army Matron now in charge of us dismounted the Queen's midwife and sent me to relieve her hard-pressed sisters in

Families for a time where there was a spate of Maltese and Anglo-Maltese babies

One morning the poison gas rattles were heard and we all donned gas masks, and I had to deliver a baby while the scare was on—a difficult task. We were not told that it was only a practice for at least half an hour during which time we had to place the infants in oval shaped rubber contraptions into which air was pumped manually through the protective mixture. We were thankful we never had another gas warning.

Life at Imtarfa was very pleasant in spite of the increasingly heavy raids, many on the fighter aerodrome at T'Kali just below the hospital complex. From our hill we had a wonderful view of much of the island which at certain times of the year was very beautiful. In October of 40 a convoy brought us reinforcements of 30 Army sisters and nearly as many RAMC doctors and from then on we felt greatly enlivened. With the arrival of a consignment of bunyales for the sisters we were able to do so much more in our off duty time. It was decided we should work alternately one whole day on duty followed by a half day. We sometimes left our wards at 8 pm loaded our bicycles with dance frock and shoes, sheet and pillow and rode as fast as we could down to the Sliema Club usually in bright moonlight and with no lights. We would dance until 1 or 2 am and then lie on the sittingroom floor of a SSAFA sister's flat nearby until about 5.30 am when it was time to start the long journey back to Imtarfa. We had to pass by the T'Kali airfield before the first daylight raid about 7 am or when the sun rose.

One morning I had a puncture and was pushing my bike up a steep hill on the last lap of my journey within a mile of the mess but not yet clear of the airfield when the air raid warning went. A Bofors gun crew in their gun pit invited me in. "You'll be quite safe in here Sister" but I thought otherwise and as gramophonically as I could refused their kind offer and ran a few yards up the road and dragged my bicycle into a navy used by guns at night, mercifully it was empty except for their friendly fleas. Very soon the raid stopped and the dust settled and I emerged, greatly relieved to see the gun crew intact as they gave me a cheery wave as I trudged on up the hill.

As the siege wore on we gradually adjusted to many deprivations. First to go was a daily bath—only one a week and four inches deep a sinister black line appeared on the enamel to remind us. Then the taps disappeared, to be replaced by a shower—one warm one per week. A sister was heard to remark "My mother always says the cleanest tribes on earth use friction!"

Shelves in most of the shops became empty except for dummy goods, and it was almost impossible to buy a reel of cotton. Toothpaste and soap and many things one had thought of as necessities disappeared. The Indian shops in Valetta moved out to safer areas with their depleted stocks of materials. Once after the convoy got in, I bought a copy of *The Times*, four months old for 2/4d and it was read by the whole mess in turn.

Our only regular way of keeping in touch with the UK was by radio. Letters could take four or five months by sea. Medical stores were in short supply and the only antibiotic we had on the wards was sulphanilamide often ruined by sea water so it had to be crushed and used as powder on wounds.

After the *Illustrious* blitz we knew that the Luftwaffe had taken over from the Italians to attack us from the Sicilian airfields and our days and nights became more dangerous. The RAF declared that they could hear the numerous JU 87s and 88s revving up together before taking off to raid us when the wind was blowing from the north. But I also remember the thrill of seeing the first Hurricane Squadron arrive and later the Spitfires—these were exciting times though sometimes sad and we lived very much in the present.

Obviously people had different ideas about danger. One afternoon some of us were returning from tennis and as we passed the main entrance to the hospital Father Zammit the retired Maltese chaplain was coming out. His usually jolly expression changed to one of acute anxiety as he caught sight of the Vice Admiral Malta's baby Austin (to save petrol) standing at the foot of the steps and flying his very small white pennant. He looked at the car and then up at the clear sky and said "I don't like it, I don't like it at all. It's just asking for us to be bombed isn't it?"

By Easter of 42 the Barrack Hospital where I was then working was without a pane of glass and the Windowlite which had replaced it was in shreds. Very fine wire-mesh was then used to darken ship was an impossibility in some wards. We worked at night with hurricane lanterns with dark blue paper from the cotton wool rolls placed round the glass. Electricity was rationed and very intermittent as the cables were laid over rocky ground and were frequently cut by bomb and shell splinters. In summer water was desperately short all over Malta and we washed ward floors with brackish water from a nearby well. Unless critically ill patients were nursed between rough brown Army blankets. Food for survival personnel was adequate but after a while the Maltese and British civilians began to suffer. In our mess we were reduced to one thin slice of bread at breakfast and

tea time. Better came out of a large tin, pinky orange in colour and looking like axle grease and we were allowed a tiny dollop on our plates at breakfast. Our cook, who was called Sultana, was a wizard at producing something really appetising out of a tin for lunch or supper supplemented with eggs from a few scrawny chickens he kept outside my bedroom window and which always seemed to be in a state of shock. Fruit and vegetables from the surrounding farms were fairly plentiful and we had fish when we were on leave at the coast, on the whole we remained very healthy. Not until we got to Cairo and its flesh pots did we realise how our digestive systems had changed: we felt positively sick when we saw the rich sweets and cakes and it took us some time before we could appreciate a large and varied diet.

The enemy was determined to starve us out, but one of many miracles happened. The fields were ripe for harvesting so the bombers came one night with hundreds of incendiary bombs and parachute flares. They saw beneath them what looked like fields of wheat in the moonlight. In fact, it was the creamy stone of Benjemma Hill and surrounding open country and they only succeeded in burning the low scrub and aromatic plants: it was a wonderful spectacle. Next day the grain in the small terraced fields was hurriedly harvested and safely stored in the age-old granaries opposite St Publius's Church in Floriana. As darkness fell one evening there was a heavy raid on the airfield and someone reported seeing an unexploded bomb fall between two blocks of the main hospital. The REs started to dig at the spot where it was thought to have buried itself: work continued for some time by the light of torches with no result until a light moved sideways and there, leaning against the wall of the building was an enormous bomb looking at them! Before it could be rendered harmless the hospital patients had to be evacuated to a deep shelter like a white coal mine cut into the limestone. That night was chaotic with TB patients lying close to acute surgical cases etc.

Next morning we washed and fed everyone as best we could and were then told all was safe to return to the wards. We later learned that two patients had died as a direct result of the move and so far as I know such a move was never again contemplated.

The Maltese children and babies were most at risk from starvation and disease and many small white coffins on their white hearses decorated with cherubims were seen at this time. One of our RAMC doctors, a large and kindly Irishman who was in charge of a reception centre for some of the out stations near the coast, decided to enlarge his jurisdiction in order to look after the health of the villages and farms nearby. In recognition of his expanded empire he was immediately dubbed 'The Jam Jar of Imjar' after the largest of the villages.

Quite by chance I was a spectator of the famous E boat attack by the Italians on the Grand Harbour. It was still dark while I watched the spectacular display of tracers and the huge flash as a torpedo struck the iron pier holding up a bridge at the St Elmo end of the boom defence and the only possible way in for the E boats. The searchlights collapsed, completely blocking the entrance thus ending the attack. During the afternoon of that day some of us were in the wards attempting to clean up the survivors, who were covered from head to foot in fuel oil—a painful operation as we had no detergents in those days. One large Italian sailor who spoke no English asked me where his Captain was and whether he was all right. Not thinking, I pointed to the ceiling and the Officers' ward above whereupon the poor fellow burst into tears, thinking his Captain had gone to Heaven.

By May 1942 all our Spitfires had been destroyed and ME 109s were patrolling the island. Flots of 80 to 100 bombers were coming over like clockwork every few hours by day and others on clear nights. Then a second squadron of Spitfires arrived and morale was high. Inevitably various buildings at Imtarfa were scarred or destroyed though we would never let ourselves believe we were a target, red crosses were very much in evidence. A block in the Barrack Hospital had been hit and the sisters' mess of Families was reduced to rubble one afternoon but miraculously no-one was there at the time. At 2 am on 5 July when the moon was full the Barrack Hospital was hit again. As I was working in 'B' Block on day duty and hearing that it had been hit on 'phoning the Duty Room I cycled the half mile through the deserted village street to the Barrack square. The moon was as bright as daylight and when I arrived I noticed strange objects shaped like fountain pens and thermos flasks lying everywhere. It was easy to miss them and not until later were we told that they were anti personnel bombs.

The Night Sister met me at the steps and calmly said that no-one was hurt but that part of the ceiling in one of my wards upstairs was down and the sky was showing through. The bomb had hit the balcony but my patients had heard it coming and baled out under their beds as the heavy stone blocks fell on them. There was one exception—Gunner 'M' who was too ill to move. A heavy door was blown horizontally across his bed, carrying the cage and bedclothes with it but leaving him unharmed.

Some of the men were anxiety cases and looked very shocked so I thrust brooms into their hands and told them to get on with the job of brushing up while we set about making tea for everyone. It was then that we discovered that our only casualty was the precious primus stove, which had lost a leg! Propped up it did sterling work for many weeks to come. We were rationed to five lemonade bottles of paraffin each week and with this we boiled water for tea, sterilised instruments, heated hot water for washing up and laundry and kept four hurricane lamps going—and this to serve two wards of 50 men each.

Patients with anxiety neurosis were admitted from time to time—mainly from the Army which was not surprising as there were thousands of troops in Malta by that time. They were treated among our minor medical cases who had no drugs and hoped that a period of rest in more pleasant surroundings would help them. I remember only one naval anxiety patient, a Petty Officer, who had been at action stations for 17 hours without respite. When his name was shown something snapped and he rushed into a deep shelter. It took four burly dockyard policemen to drag him out and up to Imtarfa in the ambulance. He was a very good type and we were able to help him with the assistance of his friend from the same mess who was in an adjoining bed suffering from pneumonia. We could never let him join the other up patients when they took refuge in a slit trench or shelter. When there was a raid he would sit on the edge of his bed in the glassy eyes and body completely rigid and seemed to be unaware of his surroundings. His friend and I would talk to him in an effort to make him relax. Day by day he improved until eventually after a couple of weeks he could carry a heavy tray of tea around the ward with hardly a jingle while the stoic Scot buried under him as bombs burst on Ta' Kali nearby. At the same time a very frightened little gunner would be lying under his bed panting like an exhausted dog. He too got better and returned to his unit.

We often had German and Italian prisoners and they were mostly decent men who got on well with the rest of the ward. I remember a Luftwaffe NCO who had fractured an arm while trying to escape from prison to steal a Spitfire and fly to Sicily. He had two armed guards from the DLI always with him with whom he played draughts for hours on end. One night when on her round the Sister was highly amused to see this prisoner who must have heard the outer door swing to sit up in bed and shake each of his sleeping guards in turn and hand them their rifles.

Although Malta was roughly only 17 miles by 12 even after living there for two years we had by no means explored in every direction. A friend and I decided to try and remedy this. Our first attempt was baulked when we were stopped on our bicycles by two Maltese guards near Hal Far and ordered to dismount. They spoke no English and decided we were spies and with a couple of bayonets in our ribs we were about to be marched off to the guardroom. We were rescued just in time by an officer who understood our protestations and were allowed to ride on to the disappointment of our captors. We learned that all troops had been warned to look out for enemy agents who were expected to land on the coast.

On another occasion we were on weekend leave at St Paul's Bay and after walking in the hills above sat down to eat our picnic lunch. We were soon surrounded by four or five soldiers who spoke only Maltese. They searched our rucksacks and pounced on an unfinished sketch of Mellieha Church in the distance which I had done that morning—holding it upside down to my fury. It was all very suspicious to them but again we were rescued to the nick of time by the appearance of a second platoon. The officer in charge spoke a little English and having identified us apologised saying, 'Germans—they drop ladies by parachute'.

One morning at breakfast we discovered that five sisters had been flown in from Egypt during the night to relieve us five reserve sisters and we had very mixed feelings as we prepared for our departure. I for one felt like a rat leaving a sinking ship for we knew that the island could not hold out much longer unless a convoy could be brought through safely within a week or two and it was sad to be leaving so many good friends behind.

Eventually we flew to Egypt on the night of 13 July 1942 in an unarmed DC3 leaving Malta as the sun went down and the long purple shadows crept over the golden buildings at Luqa. We wondered what the future held for us and especially for those we left behind.

Abstracts

Brown DC, Salmon AG. The metabolism of a [illegible] component of white spirit. Dissertation for MSc in Occupational Medicine and paper presented at meeting of the British Toxicological Society, September 1984

The petroleum fraction known as white spirit is widely used as a solvent for degreasing, cleaning and in paints and other coatings. This material has been known to cause acute effects on the central nervous system in man and animals and longer term degenerative effects have been suspected. The constituents of white spirit are mostly alkanes in the range of C to C [illegible] the remainder aromatics. Acute effects are known for many solvents and [illegible] compounds but apart from the peripheral neuropathy which is specific to C compounds there is no well understood process leading to permanent degenerative changes on chronic exposure.

In order to assess the possibility that such changes occur and to help identify mechanisms by which such effects might be produced a study of the metabolism of alkanes (the least most likely implicated in the neurological effect) was undertaken. The objectives of this work are the demonstration of the pharmacokinetics of individual compounds in the relevant size range which have not been previously reported and of the structure-activity correlations which determine the metabolic fate of alkanes of both [illegible] and branched chain configurations. This [illegible] report describes the pharmacokinetics of inhaled n-octane, a representative of the straight chain alkanes which are abundant in white spirit. Inhalation was chosen as the route of exposure since this is the probable situation in which human toxicity occurs and also the route used in animal toxicity studies. Rats were exposed in a metabolism cage developed specially for inhalation studies in which metabolites and carbon dioxide are collected continuously and the radioactive atmosphere is contained for periods of at least 24 hours before attention is required.

Excretion of metabolites was followed for up to seven days after a 24 hour exposure to n-octane vapour at ca 100 ppm. A substantial proportion (60–70%) of the total radioactivity used appeared as metabolites, the balance remaining as unchanged vapour at the end of the exposure. Of the metabolised [illegible] 43.5% was found in the urine, 20 [illegible] in the faeces and 35.6% as carbon dioxide. Substantial residual material was found in the liver and kidneys even after seven days, but residual amounts in other tissues (blood, fat, skeletal muscle) were insignificant. Compared to the known fate of n-hexane the metabolism of n-octane shows differences in [illegible] (inferred from the nature of [illegible]) [illegible] unexpected [illegible] likely metabolites. However the [illegible] metabolites observed [illegible] substantially [illegible] (12–3 days as opposed to a few hours) which has important implications for the interpretation of [illegible] toxicity studies.

Leitch DR, Hallenbeck JM. Remote monitoring of neuraxial function in anaesthetized dogs in compression chambers. *Electroencephalogr Clin Neurophysiol* 1984 57 548–560

This paper describes the development of an electrophysiological model using spinal and cortical evoked potentials (SEP, CEP) for the diagnosis and monitoring of spinal cord decompression sickness (DCS) in anaesthetized dogs. A comparison of α-chloralose with sodium pentobarbital showed that the latter caused a reduction in CEP amplitude. Continuous observation of EPs over 5 h showed a small reduction and an increasing variance of amplitude with time. The effectiveness of the method in the diagnosis of DCS and in studies of the adequacy of treatment is illustrated with several examples.

Leitch DR, Hallenbeck JM. A model of spinal cord dysbarism to study delayed treatment. I. Producing dysbarism. *Aviat Space Environ Med* 1984 55 584–91

This paper reports the development of a model of spinal cord decompression sickness (DCS) which lends itself to studies of treatment in anaesthetized dogs. Models tried early in this development could be used in the future to study blow-up and cerebral decompression sickness. We found that a dive with a bottom time of 12–15 min at 300 fsw breathing air and decompressed in 5 min produced a high incidence of cord DCS as diagnosed by changes in spinal evoked potentials (SEP). Furthermore the animals could generally be maintained on the surface using intravenous fluids, without going into shock, before treatment by compression was begun. The findings are discussed in the light of previous studies.

Leitch DR, Hallenbeck JM. A model of spinal cord dysbarism to study delayed treatment. II. Effects of treatment. *Aviat Space Environ Med* 1984 55 679–84

Using the spinal cord decompression sickness model described in Part I, we explored the effects of delay to treatment on the recovery of spinal evoked potentials (SEP). The primary treatments of oxygen at 60 fsw (2.8 bar) and air at 165 fsw (6.0 bar) were studied. In this exploratory study the results were surprisingly poor in all treatments applied. There is evidence that in this model a delay of 15–18 min between diagnosis and start of therapy would generally allow some recovery of SEP which would rarely be complete. Supporting experiments involving cord ischemia are described. The results from this study enabled us to design a set of predictable experimental criteria for the purpose of discovering the optimal combinations of oxygen and pressure for the treatment of spinal cord decompression sickness.

Book Reviews

Wylie & Churchill-Davidson's A Practice of Anaesthesia Fifth edition Edited by H C Churchill-Davidson Pp 1262 517 illustrations Lloyd-Luke (Medical Books) Ltd London £50 00

Wylie and Churchill-Davidson has so established itself in world anaesthesia that it occupies a position of considerable influence and its editor and contributors bear a heavy responsibility. A new edition is inevitably viewed with natural interest by trainees, teachers and practitioners alike.

In the fifth edition the basic layout remains the same with each Body System dealt with separately and an account given of all the relevant anatomy, physiology, physics, pathology, pharmacology and clinical anaesthesia. Topics that cannot readily be fitted into this format special chapters are included such as those on History, Sterilisation, Intensive Care and Special Situations. Although this approach is attractive to the established anaesthetist and those familiar with the book, it has not always appealed to trainees who complain of difficulty in locating a topic. This problem is greatly eased in the new edition by a summary at the start of each chapter.

In the previous edition there was a hint of staleness in some of the material and of lack of zest in some of the contributors. This is all remedied in the latest edition which presents as a totally revised and rejuvenated book. There are many new contributors drawn from the ranks of younger consultants and they have injected an air of enthusiasm and modern thinking into the text.

The editor has as before brought uniformity of style to the contributions and overlap is minimal. A particularly good feature throughout the book is the many little tables summarizing and detailing topics. They will prove excellent aide-mémoires. Another feature of previous editions that persists is the comprehensive and up to date list of references provided. The helpful practice of quoting the title of a reference article in full is continued. In keeping with modern practice the balance between topics has been changed as necessary. Substantial sections on Intensive Care, Pain Relief, Obstetric Anaesthesia and Regional Anaesthesia are included.

The book is now very heavy, nearly twice the weight of the first edition with which the reviewer was of necessity highly familiar. Like its predecessors it is aesthetically pleasing, printed on good paper and well bound but it is at the limit for one volume and will not stand too many falls from the top of the desk or the bench. Its price, £50 00, although high by old standards, is competitive by present day standards and in terms of value compares well with attendance fees for courses and symposia.

As a comprehensive textbook *Wylie and Churchill-Davidson* can still be wholeheartedly recommended. Within the office and *Lee and Atkinson* in the theatre, one would rarely need to look elsewhere for information.

Many established anaesthetists will naturally wish to update their own and departmental libraries with the new [illegible] and that those looking [illegible] textbook [illegible] have the Generation [illegible] Professional [illegible] students will not neglect [illegible] in *Wylie and Churchill-Davidson* [illegible] anaesthesia.

RR

Aspects of Occupational Health Edited by W M D Dixon and Sean M G Pettit Foreword by Professor R S F Schilling Pp 276 Faber & Faber London £5 75

This small book is intended primarily for nurses but is a useful introduction to occupational health for the young doctor thinking of entering the specialty of which he will learn little at medical school. The book covers a wide range of subjects in its [illegible] chapters including the role and training of the OH nurse, working with food, chemicals and metals, toxic dust and physical problems, overseas travel, mental health, the pharmaceutical industry and health education. There is a special chapter on occupational health in the NHS which draws attention to the neglected problems of those working in health care.

The early chapters on occupational health nursing are particularly valuable. They outline the role and training of the OH nurse in a way which will not only instruct nurses but will make clear to the doctor in industry (which includes most hospital doctors) what he can and should expect of his nursing staff. The clear emphasis on a role wider than that of the traditional industrial sick bay approach is very welcome.

A good introductory book clearly and concisely written, there is an excellent bibliography on each subject. The chapters will whet the appetite and the references and further reading sections will ensure that the reader knows where to go for more.

In the brief historical section Ramazzini is rightly credited as the father of occupational medicine. He might have been not a little surprised and gratified to learn that the Navy made its first appointment in appointing the first doctor to industry, John Pawe [illegible] at Chatham Dockyard in 1675. Seventy years later the need for a medical service was so clearly established that Devonport Dockyard included a house for the doctor and a surgery in the original plans — and the house is still in use as the Flag Officer's first and offices today.

DSW

ABC of Sexually Transmitted Diseases Michael W Adler with contributions from Ian Weller and David Goldmeier British Medical Association Inland £4 00 abroad £6 00 (incl postage)

Michael Adler is the first Professor of Genitourinary Medicine and he has written all the chapters in the book with the exception of Viral Hepatitis, Acquired Immune Deficiency Syndrome (Ian Weller) and Psychosexual Problems (David Goldmeier).

The chapters originally appeared as articles in the British Medical Journal and cover the whole range of STD from the traditional venereal diseases to the new trend in [illegible] that may be sexually transmitted. Within the compass of little over 50 pages the text is necessarily didactic but the

large to [illegible] flow diagr[illegible]

This book [illegible] himself up to date wi[illegible] speciality and would be [illegible] medical officer presently [illegible] detached duty

PJB

Manual of Intensive Care Medicine Edited by J M Rippe and M F Csete Pp 465 Little Brown Boston/Quest Publishing Agency Beckenham $17 95

This is a comprehensive and practical guide to intensive care problems The authors are American but differences from British practice are few (eg brain death) and one rarely baulks at the jargon Every section has an excellent list of references each with useful notes on its content Most are from American journals but none is too obscure for a good hospital library

Examples of omissions are: fulminant hepatic failure a discussion of options in pain relief and the prevention and treatment of air embolism in neglected venous cannulation Occasionally cross-references are wrong and I am concerned to read that a low CSF glucose is considered typical of viral meningitis The binding is spiral which does not fit well on a bookshelf but does stay open where it is left, and redeems the cost

Short sections with clear headings make for easy access aided by a good index This turns a helpful text into an admirable book which is highly recommended

RJC

Expedition Medicine: A Planning Guide Robin N Illingworth Pp 55 Blackwell Scientific £4 95

Whenever the Editor telephones and requests me to review a book my heart sinks as I find it increasingly difficult nowadays to plough through page after page of text in which I am not particularly interested It was a great relief therefore to discover that this latest task, which I reluctantly agreed to undertake was a small 55 page 11 × 18 cm book(let) which essentially is a summary of points to consider when giving medical advice to an expedition destined for some part of the world or other

The book was originally written for leaders of the Brathay Exploration Group which organises summer expeditions for young people to remote parts of Britain and abroad It does not attempt to give specific advice on the management of the variety of disorders one may encounter on world wide expeditions—such a small book could not possibly do justice to such a vast subject—but simply acts as an aide memoire to the inexperienced providing advice on what to consider in different geographical regions It is full of useful tips covering topics which range from a reminder to take flea powder on expeditions to some areas of the globe, to practical advice on the size and content of medical kits to meet different requirements

For the more experienced traveller the book has much to be desired but the bibliography is excellent—it even includes the price of the books recommended—and should provide one with most of the answers to questions that may or may not spring to mind

At £4 95 a copy I consider it a bit pricey but nevertheless recommend it as a useful starting point for all Service MOs who may be asked to provide advice on this topic.

FSCG

Basic Concepts of Neuronal Function David L Jewett and Martin D Rayner Pp 411 Little Brown/Quest Publishing Agency Beckenham $16 25

This large paperback is described as a multi level self teaching textbook Its American style of prose is at times verbose and difficult to follow but is well set out and the diagrams are good For someone like myself with no previous knowledge of neurophysiology the course seems unusually hard work, especially the chapters introducing hypothetical models of ion distribution across membranes Given that it was expected to be difficult I suspect this book gives a reasonable account and the main level layout allows one to learn out some of the minutiae

Although apparently written for medical students I suspect it is really only appropriate to physiologists and neurologists in this country and the average hospital doctor should set aside many hours of study in order to complete the course

JKR

A Handbook for Clinical Teachers David Newble and Robert Cannon Pp 148 MTP Press Limited Lancaster £7 95

This large hard backed book was written and published in Australia The authors are a physician and an educationalist and their aim is to aid the average medical officer and teacher in improving his/her educational skills

The text is clear and printed on dull paper but the cartoons on each page are of doubtful value The content is an amalgam of ideas and methods which are easily transferred to differing situations At the end of each chapter is a section on Guided Reading and a list of books and journals referred to in the text these will be most useful to those wishing to expand their teaching skills as will a short list of books, journals organisations and other resources to be found at the end of the book

Greater emphasis could have been made of the fact that teachers should help students understand as well as learn the material presented Questioning techniques and how to retrieve a teaching session that is not going according to plan would also have been useful

The size of the book restricts its use to office or home but it will be a most useful aid to all medical officers who teach whether by requirement or inclination

CMT

Letter to the Editor

Sir

We were interested to read the paper by Mr Gledhill Studies on the cimetidine resistant duodenal ulcer (Summer issue, p 70) We were surprised to read that pepsin output was increased in the cimetidine group compared to placebo and decreased following impromidine infusion especially as this is contrary to the experience of other workers

We wonder if this discrepancy could be explained by their method of storage of the specimens prior to pepsin analysis Our further work in the Department of Gastroenterology in conjunction with the Biochemistry Department, RNH Haslar has shown a pH dependent destruction of pepsin by freezing which, in fact was their method of storage Preliminary results are shown in the figure below

Pepsin in the specimens of lower pH (as for example achieved after impromidine infusion) were most susceptible to this denaturation and after freezing virtual total destruction was seen Our results show a definite increase in pepsin secretion on impromidine stimulation when specimens stored at 4 C are analysed within 24 hours

We would question the validity of the T test (paired or unpaired) because [illegible] analysis of acid secretory responses. Since this data is non parametric we feel that non parametric tests should be used

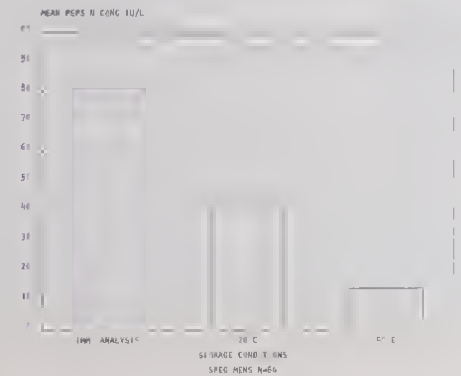
The paper also suggests there to be a stimulus to volume and acidity of gastric secretion in the non responder group which is resistant to or incompletely inhibited by histamine H receptor blockade. This resistance may be only relative and might be overcome by the use of higher dosage regimes Our preliminary results suggest this resistance to be overcome by cimetidine in the 1600 mg bd dosage.

We are etc

M Deakin FRCS Research Fellow
J K Ramage MRCP Surgeon Lieutenant Commander RN
Department of Gastroenterology RNH Haslar

REFERENCE

Peden NR Boyd EJS Callinchan A, Shepherd DM Wormsley KG The effects of impromidine and pentagastrin on gastric output of histamine acid and pepsin in man *Hepato Gastroenterol* 1982 29-30–4



The Royal Naval Medical Club Dinner 1984

THE aneeal dneeer of the Royal Navy Medical Cleb was held in the Painted Hall Royal Naval College Greenwieh on Friday 14 September 1984

Surgeon Reer Admiral G J Milton-Thompson QHP Acting Medical Director General (Naval) made the followeng speech

It is with considerable sadness thnt I stand belore yon tonight in the place of Surgeon Vice Admiral Roger Lambert He hns asked me to say how very sorry he is that he cannot be with ns tonight As many of yoe will know he has beee seriously unwell snce the end of May bnt we hope he may retnrn to light deiv in mid October I know that whee I give him se necotet of this eveneg yoe will wish me to convey the best wishes of all here assembled.

It is with great pleasere that I welcome ont principal guest the last of a distinguished lnee of Vice Chefs of the Naval Staff Vice Admiral Sir Peter Stanford. He has had a notable career inelediog Royal Yacht service and an appointment as Flag Officer Second Flotilla. It is particularly approprnate that he is with us tonight since the importance of a medical inpnt to operational planning has been highlighted by the Sonth Atlantic Campaign and a lot of work is now going into this area both by the Naval Staff ned by the Medieal Directon General (Neval) s Department. Admiral Stanford has beee VCNS sneee Octobei 1982 eed is eow presiding over the dissolntioe of thet high office I also welcome Mr Alistair Jeffrav hen aed successon to the great tradition of Samecl Fepys ned the last Deputy Uedes Secretary of Stek for the Navy Aecthes geest whose offiee awaits the exeeutioner is A r Vice Marshal David Hills. Directon of Medeal Polney and Plans. whose coerteoes impartialny and readiness to listen has been a model for central staff officers We also welcome two newcomers to onr trihal rie Air Marshal John Donald newly appointed Director General of Medieal Services (RAF) Father Noel Jones Chaplnn of the Fleet, and Professor Roy Duckworth Dean of the Dental Faeelty of the RCS(Eng) Time will not allow me to mention all onr geests bet voe are all most welcome partiee larly so since the Royal Naval Medieal Cleb is oeee again able to dine in the Painted Hall and our warmest thanks go to the Admiral President and the College staff

It is enstomary for the Medical Director General to give a state of the union message on this occasion It is not often in recent years that the spenker has been able to report a comfortable passage in the previons year and fair weather ahead Nor can I do so today Bnt we have been able to get agreement to service to sixty for Surgeon Captains and Surgeon Commanders and there are some hopefel signs on the pensions from in thnt the Armed Forces Pay Review Body in thair latest report seggested that a feedamental change based oe acteel earenigs might be appropriate

This year we have enjoyed the opportunity to celebrate two important centenaries that of Queen Alexandra s Royal Navil Nnrsing Servioe and of the Sick Berth Staff

In 1884 the first Nightingale style nnrses were introduced as sisters in a civilnn capacity under the superintendance of a Head Sister and employed in the Naval Hospitals at Haslar and Plymouth Seceeeding generations of the Royal Naval Nersing Service heve produeed highly motivated and professionelly skilled sisters and nerses aed deserve our warmest congratelations oe their centenary We have come a long way from the eighteenth eentery when the governing body at Haslar were obliged to dismiss eerves for smeggling gin and one for giving the patients a foel diocese Matron in Chef is not here tonight bet Miss Northway congratulations on yonr Service s centenary

This year is also the centenary of the Royal Naval Sick Berth Branch established by Oider in Connel on 17 Octobar 1884 Always an essential part of a ship s company from the loblolly boys to

the present day Medical Assistant and Medical Technician the Sick Berth Branch can be justly proud of their traditions and their high professional standards. Commander Hussey congratulations to you and all your merry men on your centenary.

Although he has not yet reached *his* century this is an appropriate moment to say farewell to Surgeon Rear Admiral Jim Cox who is making positively his last appearance in uniform on this occasion. We wish him tight lines and many years of contented retirement.

This year has been a year of reorganisation and turmoil throughout the Ministry of Defence. As many of you will know Sir Henry Yellowlees lately Chief Medical Officer at the Department of Health was invited by the Under Secretary of State (Armed Forces) to enquire into and report on three aspects of the Defence Medical Services on the Headquarters organisation, on the hospitals and on the reserves. Sir Henry has reported on the Headquarters organisation and is now working on that of the hospitals and reserves in carrying out this unenviable task he has been obliged to work to a very tight timescale imposed by Ministers.

The Secretary of State has accepted the major recommendations of Part I of the report that there should be a unified Medical Services HQ Organisation, headed by an officer of 3 star rank (initially from the Army) who will be supported by *two* uniformed Deputies at 2 star level. In addition the Dental and Nursing Services will also have a single supremo who alone will hold the rank of the three existing heads of Service. Below this level five one Star Assistant Surgeons General will oversee functional areas of policy making. Ministers have been emphatic that three separate uniformed medical services shall continue a view that I believe we all welcome. But it is difficult to accept arguments seeking to justify the errors arrangement of a Surgeon General and two Deputies each head of their own Medical Service. The Surgeon General is in a very difficult position as both Purple-Hatted and Head of Army Medical Services. On a wider stage the Chief of Defence Staff and the Central Staff who make policy are divorced from single service management and administration and I believe the same should apply in the medical world.

I am also concerned that Sir Henry does not seem to have been made fully aware of the complexity of the Naval Operational task and the unique spread of experience of medical support in sea land and air warfare that the RNMS has at present. As VCNS knows well the problems of supporting amphibious warfare and a land battle north of the Arctic Circle all the responsibilities of the RNMS is so complex a three dimensional piece basile on the North German plain even of the total numbers involved are considerably smaller. Having visited the Royal Marines in North Norway in February and RAOR in little earlier I am well aware of the difficulties that face us all.

All this makes me wonder whether we are failing to make our case to those who need to know. Too often the Navy fails in this respect and perhaps we should abandon our tradition of being the silent Service. Many of you will recall Admiral Sir Desmond Cassidi at a previous dinner of this club telling us that the Naval Medical Service should sell itself more effectively to our executive colleagues. The South Atlantic Campaign doubled us to show the Navy and the Royal Marines that medical support was both necessary and effective. Now we must make our case more effectively to our political masters.

I have of course represented my views to Lord Trefgarne to VCDS (P & L) and to the Second Sea Lord but the Yellowlees proposals for Headquarters have been accepted by Ministers and we must now make this arrangement work. General Cameron Moffat, the Surgeon General (Designate) unfortunately cannot be with us tonight but we all wish him well in his new appointment and I have already assured him of the loyalty and full support of the RNMS in his endeavours.

In welcoming some of our guests whose appointments are about to disappear and describing to you the fundamental changes coming about in Headquarters you may feel that times are harder than ever. I would not wish you to leave with that impression. We have faced the turmoil of major reorganisation before and can do so again and I have no doubt that the Royal Naval Medical Service will prove as adaptable and resilient in the future as ever it has been in the past, and that our task is thoroughly worth while.

We must now face up to the future and make a success of the new arrangements. Only the faint hearted would wish to back out now. Hold on to your hats there is an exciting ride ahead.

And so to my main business. Members of the Royal Navy Medical Club I give you the toast our guests.

Vice Admiral Sir Peter Stanford KCB MVO Vice Chief of the Naval Staff replied on behalf of the guests.

Mr President fellow guests ladies and gentlemen of the Association. It is a very great honour and privilege to be here as your Guest of Honour on this very special occasion. I know I speak for all of you

in saying how sorry we are that Surgeon Vice Admiral Roger Lambert is not here and he asking you Mr President, to convey to him our very sincere best wishes for his early and complete recovery

I am not sure of the qualifications which have brought me here to be your guest tonight. There are a number of alternative possibilities. Is it as a graduate of a short course in undergoing naval surgery from which I emerged as good as new? Perhaps it is that as a subject for imminent reorganisation (in medical terms so far as my particular job is concerned, one could say a subject of terminal reorganisation) I can offer solidarity if not comfort, to those who are equally undergoing the prospect of reorganisation. Or perhaps it is as your President has said that the last in a line of Vice Chiefs of the Naval Staff can be regarded as of scientific interest like a dodo or passenger pigeon. I trust however that you would not be so inhospitable as to bottle me in spirits and display me in that gruesome museum in Haslar.

Faced by an audience of the medical fraternity one is invariably conscious of one's own health and I do believe very strongly in the importance of diet and good health. But I must say in passing that I find the constant shifts of the goal posts as one studies the papers on what is good for you and what is not good for you to be endlessly confusing. Not being one for jogging I have had to rely on other means to maintain my health and I can assure you that the business of survival in the MOD is what keeps us fit and on our toes. We have been as your President he said in the throes of very substantial reorganisation traumas during the last six months.

I am reminded of the story of the Second World War. A US Navy destroyer was feeling her way through fog in mid Atlantic towards a rendezvous with a British destroyer. In those days radio silence was a matter of considerable importance and the US had been briefed very carefully on how important it was to maintain radio silence and how the British Navy was frightfully good at using flag signalling as a means of communication. As these ships groped towards the rendezvous in fog, the British ship saw the American ship appearing through the mist with two flags flying from the mast head. One of them was the Church pennant, the flag which ships fly when the ship's company is at prayer and the second flag was the interrogative pennant which is a flag used to give an interrogative sense to a signal. The signal therefore read 'Church Interrogative'. The Yeoman of the British destroyer searched his books in vain and finally in desperation, he picked up his morse lamp and signalled to the American destroyer 'Your signal not understood'. Back came the answer 'My God, where am I?'

You may think that in terms of the current traumas in the MOD reorganisation this is a fair question. The MOD is large and unwieldy. It is the largest of all the Ministries employing one third of all the civil servants. People are expensive and defence is expensive so it is important to concentrate the cost at the sharp end. The Secretary of State has said quite unequivocally that the full value of increased resources must be translated into increased fighting effectiveness and not into unnecessary overheads and bureaucracy and that, of course, is the main spring of his initiative to reorganise the MOD. The MOD has been subject to endless reorganisation since its conception in 1946. The early attempts lacked muscle to challenge the strength of the single Service Departments of State—the Admiralty, the War Office and the Air Ministry so it was not until the report by Generals Ismay and Jacob in 1963 that the first real effort was made to try and coordinate the business of defence policy into one sensible grouping which was responsible to the requirement for making the best use of defence resources as a whole. This led to the Mountbatten reorganisation when the three Services abandoned their real estate around Whitehall and concentrated for the first time under one roof—a move made necessary because Lord Mountbatten insisted on the centralised control of the formulation of policy. Lord Lewin in 1982 strengthened the central Defence Staff but still the Secretary of State recognised that it had not gone as far as the original authors had intended, let alone as far as he wanted. So he prodeced in March of this year an Open Government Document setting out the main principles on which he wished to reorganise the Ministry of Defence. There was no doubt about it that there was to be a very substantial change in the way in which we the Forces, go about our business.

The Defence Staff will comprise four pillars—Commitments which is what we used to call Operations, Systems which we used to call Operational Requirements, Programmes and Personnel which we used to call Plans and Policy which we still call Policy. This structure is now to be established from 2 January in an enormously strengthened central staff. It is also important to remember however that so far as the single Services are concerned the Chief of Staff in our case the First Sea Lord, retains the responsibility for the total effectiveness and morale of his Service. He remains the professional head of the Service. To do this some adjustments are necessary. Firstly he

must have access to that big defence staff and to be able to task it to respond to his requirements as well as those of CDS. He nevertheless requires a separate Naval Staff. This will be smaller than the Naval Staff that we have now and headed by a 2 star officer. This staff will brief him as a member of the Chiefs of Staff Committee and as a professional head of the Service. To assist him in this latter responsibility requires the creation of a new grouping called the Service Executive Committee—the Navy Board which will manage the day to-day affairs of the Navy.

There is a lot of work still to be done to make sure that this transition can actually be achieved satisfactorily and there are a lot of questions still to be answered. It is rather like motor racing. During the first lap drivers jockey for position and the dangers are very substantial. The race can be won or lost in those early minutes. The Dublin correspondent of some sporting newspaper whilst watching the British Grand Prix decided that the ideal solution was to start the race on the second lap—well we probably cannot afford that luxury much as we would like to.

You too are going to be subjected to the reorganisation and we heard mention of the proposals of Sir Henry Yellowlees. I would only say to add to what has been said that it is the firm position of the Admiralty Board that any reorganisation of the Medical Services must not venture beyond the principles established in connection with the reorganisation of the MOD itself. In other words the formulation of central policy may be an issue for central staff but that management, control of personnel structures, and career planning must remain firmly in the single Service area. We learned in Operation Corporate the value of the dedicated uniformed Naval Medical Services and we certainly needed them we needed them for our sort of fighting and that is a position to which the Admiralty Board is committed.

Looking over and beyond reorganisation it is important to remember that we in the MOD and elsewhere ashore exist to serve the sharp end at sea. Out there there is a tough, lean, professional, very busy and effective Navy. It is manned by well motivated, highly trained people. It has come a long way since the dark days of the White Paper in 1981 that nadir of the Navy's fortunes that evidence of what the First Sea Lord in his address to the RUSI earlier this year called "sea blindness" in our national awareness of the world scene and of its dangers. There is now in the last few months a far greater awareness of the importance of the utility of maritime power of ships and maritime aircraft. The Soviets know this too. Operation Corporate helped a very great deal but there are also wider influences at work. These influences are evident when you see then the instabilities throughout the world which the superpowers are less and less able to control. Look at the way in which warships are constantly able and ready to serve political ends in the Gulf, the Caribbean off Beirut and now in the Gulf of Suez. Ends which are as often as not to do with forestalling hostilities as engaging in them. This is what deterrence is all about. Because you cannot tell where an aggressor who by definition has got the initiative may strike you need the flexibility and the mobility of ships and maritime aircraft. You need the ability to advance, withdraw, concentrate, disperse without violating frontiers or abandoning ground. These are the unique characteristics of maritime forces particularly in a time of tension.

The Navy towards which the Admiralty Board is now working is essentially a flexible balanced Navy. One which pays adequate attention to organic air support and to anti-submarine and anti-aircraft defence. One which also pays attention to the requirement for amphibious forces. Do not forget that in 1974/75 the Government rejected replacement of amphibious forces we hope to be able to recover from that situation. The Fleet will comprise a balanced force of submarines including the Trident nuclear deterrent submarines a new generation of diesel submarines a balanced force of destroyers frigates and patrol vessels, need a much greater measure of force with both high and low level capability with hunters and sweepers some of which will be manned by the RNR.

This is of course a very special year for the Naval Nursing Service and the SBA's Branch—the Medical Assistants and Medical Technicians—for this is their 100th Anniversary. So it is particularly good to be here to congratulate those of the Branch and to bring you best wishes for the next century from those of us whom you look after so well.

As we look about us—at the MOD reorganisation, at Yellowlees it is clear that we are entering a period of change. Let that not depress us, despite a natural predisposition against change—but with faith, some luck and lively reactions to the opportunities that change brings. I think we can be confident that the future is full of promise.

Service News

OBITUARIES

SURGEON CAPTAIN J K SALMON MRCS LRCP RN

Retired died on 23 July 1984. He entered the Royal Navy as a Surgeon Lieutenant in July 1939 and was placed on the Retired List in 1968.

Surgeon Rear Admiral D P Gurd writes

Kenneth Salmon was a very well known officer during his period of active service and was held in much affection. I first met him in 1945 when he joined the RN Ancillary Hospital Brisbane where we were living in very Spartan conditions with the Australian Army. Kenneth expressed horror at the state of affairs and contrived to obtain a number of comfortable armchairs for the Wardroom. He quickly became the life and soul of the Medical Mess, showing a remarkable capacity for finding those people who could help the Mess in all sorts of ways. Our journey to Hong Kong from Sydney was a great joy to him and he played a very active part in the restoration of the Royal Naval Hospital Hong Kong, in its temporary quarters in the Queen Mary Hospital Pokfulam. It was here under the guidance of Dr John Barr that Kenneth became a master of radiological technique and acquired incomparable experience when dealing with all kinds of illness in patients neglected for years by the Japanese. His opinion was often sought by experts for the elimination of chest conditions.

He was an extraordinarily good tempered officer whom no situation could upset. It was noted early on that he frequently used certain clichés in conversation and these were soon reduced to their initial letters — My dear fellow becoming M D F and How absolutely right you are! was rendered as H.A.R.Y.A. This code was developed by the entire Mess and visitors were sometimes taken aback on entering the Wardroom to hear officers conversing in apparently meaningless alphabet. For years former mess-mates have sent me strings of letters for interpretation, saying that they can still recall the sequence of the capital letters but have forgotten the words for which they stood!

Kenneth did not rush his medical education and with a wisdom which may not have been apparent at the time, he experienced the joys of London social life in the irrevocable glory of the thirties. He loved good music. He was a connoisseur of wines and food and was an expert cook. The hospitality which he and his charming wife extended will long be remembered. He loved the Navy and was above all a true and loyal friend.

Surgeon Vice Admiral Sir John Harrison writes

I didn't know Kenneth Salmon well until he was Head of Department in Radiology in Haslar in the early sixties when he had a remarkably defined life style. A quick accentate sensible radiologist with a wide experience of chest diseases he lectured in the important matter of good radiography and a well-ordered department. He achieved both with relaxed ease on happy ship principles.

As early risers and a practical outdoor chap Kenneth was also a tremendous bon vivant and a good friend and he and Esther dispensed superb hospitality at Brading, though at the time, like many senior serpents he seldom came to the Mess, which was its loss. To return to Haslar with Kenneth in the early morning on the Isle of Wight ferry was both exhilarating and exhausting, until he mounted the famous bike by the time I arrived in Haslar he would be changed and working.

In the department we got on with the work in our own ways but always met for a daily chat, and it surprising the ground we covered until with a quick glance at the clock and I'm off now John. Kenneth was away. We both enjoyed these talks and often same throw-away remark was discussed again the next day.

Despite his courtesy bonhomie and impertinability Kenneth was a private, thoughtful chap. All one's memories of Kenneth have a glow of fun and friendship the joyful really fresh whirlwind of German wine talking for the Navy and Barts. And you couldn't tell him much.

SURGEON CAPTAIN (D) R SYMMONDS VRD LDS RNVR

died peacefully at his home in Oxford on 14 September 1984 aged 78.

Ralph Symmons joined the London Division of the RNVR as a Surgeon Lieutenant (D) in 1929 after qualifying at Guy's Hospital. His early training periods were spent in various naval hospitals and he served in HMS *Devonshire* in the 1937 Coronation Review. He was mobilised at the outbreak of hostilities in 1939 and he served at HMS *Raleigh* on commencement, so being in the van of many of his professional colleagues who were later to serve at Torpoint. Further wartime service included the hospital ship HMHS *Oxfordshire* the RN Air Station HMS *Nature* and the coders training establishment HMS *Cabbala*. He was granted the Acting Rank of Surgeon Commander (D) in 1944 as SDS of HMS *Raleigh*.

At the end of the war Ralph returned to civilian practice but continued to retain his considerable interest for the Reserve and he held the appointment of Senior Dental Surgeon HMS *Precedent* from 1952 to 1955. He was promoted Surgeon Captain (D) in 1955 and finally retired in 1958.

A keen sailor Ralph Symmons was for many years a member of the Royal Sailing Association. He will be remembered for his unflagging enthusiasm freely by a True Volunteer spirit. We extend our deepest sympathy to his wife Jeanne his sister, his brother Surgeon Captain (D) John Symmons RNR Retd, and his four children and ten grandchildren.

We regret that we have only recently learnt that **SURGEON CAPTAIN (D) R J McA ANDREWS LDS RCS Ireland RN Retd** died in March 1983 at the age of 85 and have received the following appreciation from *Surgeon Rear Admiral (D) W I N Forest.*

Reggie Andrews was born in Dublin on 14 October 1898. He served in the First World War in the Merchant Navy as a wireless operator and was awarded the Mercantile Marine Medal (Wireless) in 1918. In that same year he transferred to the RAF as a Flying Cadet. After the Armistice he returned to Dublin and undertook dental training, qualifying LDSRCS Ireland in 1923. He re-entered the services as a Surgeon Lieutenant (D) in July 1923, not long after the establishment of the Permanent Dental Branch of the Royal Navy. He rose to the rank of Surgeon Captain (D) being promoted to that rank in June 1950. He was placed on the Retired List on reaching the statutory age of 57 but continued in retired service until October 1958. He saw service in those great battleships HMS *Malaya* and *Valiant* before the war. In 1938 he was appointed to RNH Bermuda and after the Second World War undertook two commissions in Malta, first at RNH Bighi and later from 1952 to 1955 as Command Dental Surgeon to Commander in Chief Mediterranean.

He was a most respected officer and able dental surgeon, always immaculate in appearance and fair and correct in administration and with his colleagues. He sometimes seemed a little formidable but this was a facade for an underlying character of great humanity tempered with a nice sense of humour and moderation.

On his release from the Royal Navy he retired to Ferndown in Dorset to indulge in his love of gardening and his flowers, particularly roses. Nevertheless he agreed to undertake dental treatment for several years for the Army at Blandford. Thus he was one of the few who saw service in the MN, RAF, RN and Army—a rather unusual record.

Alas, he was quite suddenly stricken with blindness so that his dreams of a long-term retirement of gardening and flower culture had to end. His character enabled him to accept this shattering blow with wonderful equanimity. He and his wife moved to a flat in Bath where he died. We who knew him remember a courteous, staunch and well loved colleague.

SURGEON COMMANDER J THOMAS DSc MRCS LRCP DO RN Retd died in hospital in Southampton on 14 June 1984 after a short illness. He was 73.

Educated at the University of South Wales and the Welsh National School of Medicine, John Thomas entered the Royal Navy as a Surgeon Lieutenant in 1938. He was awarded the DSC in 1940 for gallantry and devotion to duty while serving in HMS *Punjabi* during the Second Battle of Narvik. His subsequent appointments included HMS *Cabot*, *Pembroke*, RN Hospital Kingseat and following promotion to Surgeon Lieutenant Commander in March 1944 the hospital ship *Oxfordshire*. He was promoted to Surgeon Commander in 1953 while serving in HMS *Triumph*. He also served in RNH Malta and his last appointment was to RNH Chatham, being placed on the Retired List at his own request in June 1960.

Any personal recollections would be welcomed by the Editor.

SURGEON COMMANDER (D) T G de C EMBERSON LDS RCS Eng RN Retd died on 4 May 1984 at the age of 81.

Surgeon Rear Admiral (D) W I N Forrest writes:

Tom Emberson was born in Chertsey, Surrey on 4 March 1903, received his dental training at Guy's Hospital and qualified LDS RCS Eng in February 1927. After several short periods in private practice he decided to join the Royal Navy, in which he served from March 1928 until his retirement as a Surgeon Commander on 9 March 1958.

Those of us fortunate to remember him recall a most valued, kindly, respected and able colleague whose skill and ability caused him to be selected as a Senior Specialist in Dental Surgery, serving in the Royal Naval Hospitals Malta, Haslar and Plymouth. He served in the battleships *Royal Sovereign* and *Resolution* before the war and as Fleet Dental Surgeon to Commander in Chief East Indies, based in Ceylon, afterwards.

He was one of that very good selection of entrants that built the Dental Branch such a high reputation and established dental treatment as the routine preventive health measure of today. He is survived by his wife Elizabeth to whom we extend our greatest sympathy in her loss.

SIR JOHN McNEE DSO MD DSc FRCP FRCPEd FRCPGlas LLD (*J roy nav med Serv* 1984 **70** 124)

Surgeon Captain F S Preston RNR writes:

I was most interested in the obituary so ably written by Sir Francis Avery Jones on Sir John McNee. I was one of his senior students at the Western Infirmary, Glasgow, when he was also serving as Surgeon Rear Admiral in Scotland and frequently appeared in uniform to carry out his ward rounds at the Western Infirmary. He normally wore a white coat over his uniform and one day he examined a rather cheeky young Able Seaman and in conversation made a remark about the Royal Navy. The young Able Seaman cheekily said, 'What do you know about the blinking black Navy?' Pulling up his white coat sleeve to reveal his Admiral's stripes Sir John replied, 'What do you think about that, my boy?' Collapse of young Able Seaman.

One of our senior Surgical Consultants very kindly donated his Rolls Royce to him as an office and much to his chagrin he next saw his valued automobile being driven at breakneck speed by a young blonde Wren with Sir John as

[illegible] when the W[illegible] causing [illegible]

Despite [illegible] S[illegible] J[illegible] he was held in very high [illegible] students and staff at the Western [illegible]

DR F CAMPBELL GOLDING MB ChM FRCP FFR DMRE, for many years Civilian Consultant in Radiology to the Royal Navy, died recently and an obituary will be published in the next issue

HONOURS AND AWARDS

Queen's Birthday Honours

Member of the Order of the British Empire

[illegible]

British Empire Medal

Chief Petty Officer [illegible] McC[illegible]

Chief Petty Officer Medical Assistant T W Geaghy

Royal Red Cross

Miss E Meiklejohn Principal Nursing Officer

Associate of the Royal Red Cross

Miss L M T McCluskey Chief Nursing Officer

Miss M E Atherton Superintending Nursing Officer

Miss P M Hambling Superintending Nursing Officer

RN MEDICAL AND DENTAL OFFICERS

Higher Qualifications

Surgeon Commander G H G McMillan—MRCP (Glasg)
Surgeon Lieutenant Commander S Q M Tighe—FFARCS
Surgeon Lieutenant Commander J W Turvill—MRCGP & DRCOG
Surgeon Lieutenant Commander (D) J G Iles—MGDS RCS Eng & MGDS RCS Edin
Surgeon Lieutenant Commander (D) D C C Alexander—MGDS RCS Eng & MGDS RCS Edin
Surgeon Lieutenant M L Cowley—MRCP
Surgeon Lieutenant S H Murch—MRCP
Surgeon Lieutenant P I Raffuelli—MRCGP
Surgeon Lieutenant S J Squires—FFARCS

Promotions

To Surgeon Lieutenant Commander

A S C Allison K J Atkinson J A Burkett
R J Clark M L Cowley S D Evans
G J Findlay J K Ramage W R Saywell
S Q M Tighe M L Ward P J Warnock

To Surgeon Lieutenant

A J Burgess P I Crawford R A Cribb
J M Glancy G E D Howell C J Howells
A S Hughes A K Lillywhite A W McEwen
P J Mann A J D Neal R C Scott
A W Scott-Brown A P Stoddard R N A Wood

To Surgeon Lieutenant (D)

J R Mann M M Wilkins

To Acting Surgeon Lieutenant

N Q Allison C B Berry S P G Bird
P J Buxton M Caiger R M Cox
D F Cumberlidge P K F Davies F S Ellis
P M Kemp P H Lovelady S A Johnson
A W Morrison J N Perry J M Price
R D S Wylie

Provisional selections for promotion to take effect 31 December 1984

To Surgeon Captain

F St C Golden OBE D J McKay

To Surgeon Commander

W M Edmondstone T R D Riley
P J Shonkibi MBE J J W Sykes

To Surgeon Commander (D)

R J Griffiths

Bayer Surgical Prize

Surgeon Commander J O Saul has been awarded the Bayer Surgical Prize for the best surgical presentation by a surgeon under training.

British Film and Video Festival Awards

Two naval medical instructional films were successful in the training section at this festival. Winner of the Gold Award was *Handle Him with Care Part 2* (technical adviser Lieutenant (MS) Kenneth Baker) while the Bronze Award went to *The ABC of CPR* (technical adviser Lieutenant (MS) John Dalgleish). The awards were made by Sir Monty Finniston at a banquet in the Metropole Hotel, Brighton, on 22 June last and were accepted on behalf of the Navy by Rear Admiral R. W. F. Gerken CBE, Director General of Manpower and Training.

Surgeon Lieutenant Commander D [illegible] RNH [illegible] MBE receives the Edinburgh [illegible] 1983 Commendation from Commodore David Morse, C[illegible] [illegible]

RNH [illegible] Surgeon Lieutenant Commander [illegible] Surgeon Lieutenant [illegible]

NEW ENTRIES

Surgeon Lieutenants R. P. Johnston, A. A. R. Mostyn, D. Russell, J. G. Sankdng
Surgeon Lieutenants (D) A. R. Liddell, S. J. Lagunn, D. R. Wallace
Acting Surgeon Lieutenants: Miss J. A. Duncan, N. J. A. King-Turner
Surgeon Sub-Lieutenant J. B. McKnaring

TRANSFERS TO FULL CAREER COMMISSION

Surgeon Commander J. R. C. Cavin
Surgeon Lieutenant Commanders: K. J. Aitchison, L. J. Jarvis, J. K. Kamage
Surgeon Lieutenants: J. R. Broome, G. W. L. Evans, K. Gillespie, C. M. Jamin, M. N. Jeffrey, A. Quaile

RETIREMENTS

Surgeon Rear Admiral J. Cox OBE (left) with Surgeon Rear Admiral Hampton who succeeded him as Surgeon Rear Admiral (Support Medical Services) retired in August after 32 years in the Service.

Jim Cox was educated at Durham School and proceeded to study medicine at the Royal Victoria Infirmary Newcastle, qualifying MB BS (Durham) in 1951. He joined the Navy in 1952 and shortly afterwards was appointed to HMS *Birmingham* in the Far East where he served as a Surgeon Lieutenant and saw active service towards the end of the Korean War.

On return to the United Kingdom he proceeded in HMS *Ocean* and HMS *Indefatigable* for short periods before commencing training at the Royal Naval Hospital Plymouth late in 1954 until 1957. After passing the Primary Fellowship examination he worked in Newcastle with Professor Pask, and in the research department of anaesthetics at the Royal College of Surgeons with the late Professor Woolmer, which included early work on apparatus for resuscitation. He was awarded the OBE in the 1964 New Year (Honours List. He was the first naval anaesthetist to pass the final FFARCS (England) by examination in 1960 and was appointed consultant in anaesthetics in September 1961. For most of his anaesthetic career he moved in the Royal Hospital Haslar (1975-77) as Consultant Adviser.

In addition to serving in HMS *Bulwark* (1971-72), Admiral Cox served as Staff Medical Officer to Commando Forces (1977-80). This was a job with a new kind of challenge which he enjoyed and in which he contributed a great deal. His efforts were responsible for the improved quality of medical support to the Commando Brigade which was proved to be so effective during Operation Corporate. His next appointment was as Medical Officer in Charge, RNH Plymouth (1980-82). He was promoted Surgeon Rear Admiral (Naval Medicine & Training) and Dean of Naval Medicine in August 1982 and Surgeon Rear Admiral (Support Medical Services) in May 1983.

Always respected by everyone, his wide experience enabled him to give wise and sensible advice to all naval anaesthetists, both serving and retired. There are many who have reason to be grateful for his help.

A large and genial man in every sense, he has always supported Mess life to the full and is an excellent entertainer. He has recently been invited to become an honorary member of the Medical Mess at Stonehouse. His generous hospitality at all times will never be forgotten.

In retirement he will have time to pursue his many hobbies of fishing and stamp collecting. His many friends wish him and Liz a long and happy retirement in their home at Mary Tavy.

PLACED ON THE RETIRED LIST

Surgeon Captain M. J. Boyle DSC
Surgeon Commander P. S. Ormrod

PLACED ON EMERGENCY LIST

Surgeon Lieutenant Commander R. J. Whitney
Surgeon Lieutenant Commander (D) R. W. Mills
Surgeon Lieutenants E. P. Collinson, P. J. G. Hutchings, A. B. Maclean, N. M. Munro, J. D. Tolliday

ROYAL NAVAL RESERVE

Higher Qualifications
Surgeon Lieutenant F E Luscombe—FFARCS

Promotions
To Surgeon Lieutenant Commander
J Cornish (CLAVERHOUSE) R W McCollum (CALLIOPE) D P Timms (WESSEX)

Retirement
Surgeon Commander H W H Sheppard RD*

MEDICAL SERVICES BRANCH

Higher Qualifications
MT(H) J L Hollie—BA (Open University)

Promotions

To Lieutenant (MS)
K Baker

To Acting Sub Lieutenant (MT) (L)
S McKinlay

To Acting Sub Lieutenant (MT)
M L E Genevese
L W Smith

To Chief Petty Officer Medical Assistant
K B Rten
C Jones

To Chief Petty Officer Registered General Nurse
J Smith

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

Promotions

To Superintending Nursing Officer
Miss P J Hewitt, Miss H R M Schofield

To Nursing Officer
Miss J E Darbyshire
Mr P A Russell

New Entrees
Senior Nursing Officers Miss S A W Chamber
Miss G R M Cinnie Miss A Lucas D R Papps
M A Yates
Nursing Officer Miss E B Turner

RNMSS PRIZE GIVING 1984

The annual Royal Naval Medical Staff School prize giving was held in the Haslar Club on 13 July last with Miss Jean Robertson RRC QHNS Matron-in-Chief QARNNS as guest of honour. Many parents, relatives and friends of the recipients were present for the ceremony after which tea was served in the Junior Rates dining hall.

Of the 52 EN(G)s eligible to receive certificates and badges, 27 attended and 21 out of 28 RGNs were also presented with their certificates and badges. Several individual prizes were also awarded and details are given below.

The Peters Prize Having been so impressed by the quality of care given to his terminally ill wife by naval nurses Mr Peters endowed this prize in 1965 which is given to the two best female or male nurses at the end of their year of training.
Awarded to PSN A Butler Set 10
PPN C M Kelly Group 8

The Ruth Carter Prize for Nurses has been established in memory of the late Miss R Carter Principal Matron QARNNS by her next of kin. The award is made to a nurse in training, male or female, who is judged by the award committee to have made a notable contribution to nursing and patient care in the Royal Navy with special emphasis on research into improved nursing management techniques in wards and sick bays ashore and afloat. The prize is £75.
Awarded to Mrs M Morris (CPOLN(G) R di

The Admiralty Board School Book Prize is awarded to the best enrolled qualifying nurses of their year. The books are chosen by DNPR, suitably engraved and presented to the library of the secondary school where the nurse was educated. The nurses receive the Admiralty Board Certificate.
Awarded to EN(G) L Vengotta (Moreton College of Further Education)
ALRGN J E Cooper (Beaconsfield Secondary School)

The Class Prizes of £5 each for the best student in each class of learners covering academic and practical ability and overall assessment of attitude and professional enthusiasm.

Awarded to	LRGN S B Powlesland	Class 53
	LRGN H McCarthy	Class 54
	LRGN E Seymour	Class 55
	EN(G) J Carter	A Class
	LEN(G) K James	B Class
	EN(G) A J Scammell	C Class
	EN(G) A J Oultram	D Class
	MA A Edwards	Agadir Class
	MA J C Anstell	Clyde Class
	MA S P Judge	LMAPQC 1/83
	MA R M Burton	LMAPQC 2/83
	MA K J Stockland	LMAPQC 3/83
	MA J A Rodgers	LMAPQC 1/84
	LMA C J Batten	MBSRQC 2/83
	MT2(PD) J Kemp	MBSRQC 3/83
	LMA G W Selfe	MBSRQC 4/83
	LMA S P E Hayward	MBSRQC 1/84

The Best Technician Prize of £5 is awarded to the best overall student completing a three year specialist technician training.

Awarded to PMT(R) T E Sullivan

The Herbert Lott Naval Trust Fund course prizes of £30 are given to the top academic qualifiers of the LMAPQC and MRSRQC

Awarded to MT2(B) N J Broom
MA A Robinson

The Ajax Bay Prize has been established from a fund inaugurated by Surgeon Commander R. T Jolly OBE RN who was Officer Commanding the Ajax Bay Field Hospital during Operation Corporate. The prize winner will have successfully completed the LMAPQC during the previous year and be assessed as displaying the qualities of determination, flexibility and a sense of humour. These qualities have been identified as the key characteristics of Ajax Bay medical personnel. The prize, a sporting, pictorial scene from Operation Corporate, and an autographed copy of *The Red and Green Life Machine*

Awarded to MA M. Darrah Commacchio Gp RM

DEFENCE COUNCIL INSTRUCTIONS

Recent medical and other relevant DCIs are given below.

DCI RN 125/84	Higher appointments in the RNMS—new terms of reference and addresses
126/84	Promotion to SD and SL Lists AIB 1985
127/84	The Ajax Bay Prize
128/84	Change in QARNNS ratings titles
217/84	Dental Surgery Design Steering Committee
228/84	Sick Berth Petty Officers Efficiency Medal
229/84	Erroll Hidridge Fund and Prizes
230/84	The Ruth Carter Prize for Nurses
267/84	Royal Naval Medical Service—degrees and diplomas
268/84	Transfer of MDG(N) Medical Records Section from HMS *Centurion* to RNH Haslar
326/84	QARNNS Officers—extension of Short Career Commission

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